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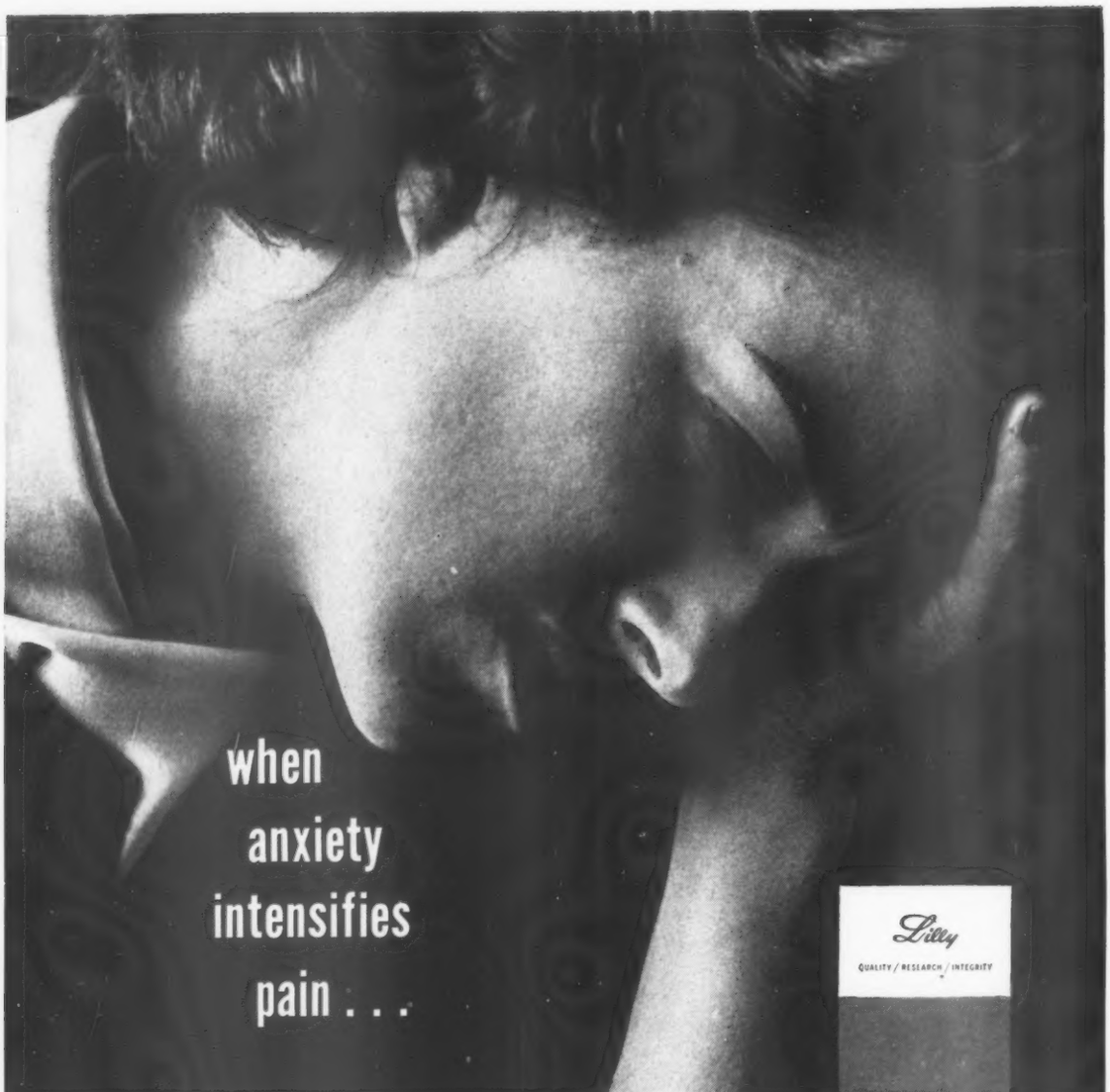
WHAT PRICE SUCCESS?



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Dear Sirs:

Project HOPE has Formulary Service

DEAR SIRS: Mr. John Spreckelmyer has told me of the assistance you have given him in the task of developing the pharmaceutical requirements of Project HOPE. He also has shown me the "Hospital Formulary" which you presented to the Project and which you plan to keep up to date as supplements are issued.

We are most grateful for your generous support of our Project, and your willingness to give us the benefit of your experience and knowledge in the pharmacy field. You may be certain that we are going to call upon you from time to time.

Thank you very much.

WILLIAM B. WALSH, M.D., *President*

Project HOPE
The People to People Health Foundation, Inc.
P. O. Box 9808
Washington 15, D. C.

EDITOR'S NOTE: ASHP President Vernon O. Trygstad recently presented a copy of the *American Hospital Formulary Service* to Mr. John I. Spreckelmyer, Administrator of the hospital ship "S.S. Hope."

Whitney-Spease Scholarship Fund

DEAR SIRS: Thank you for sending me the AMERICAN JOURNAL OF HOSPITAL PHARMACY for September.

It was a pleasure to read about the plaques which were presented, and also about the Whitney-Spease Scholarship. I am so glad that the first one could go to Harvey Whitney Jr.

It makes me very proud and happy to know that my husband's work was so appreciated.

. . . Thanks again for your kindness.

ALICE SPEASE

12 John Clark Lane
Hudson, Ohio

EDITOR'S NOTE: Mrs. Alice Spease is the widow of the late Dean Edward Spease.

DEARS SIRS: I am enclosing a contribution for the SOCIETY's Scholarship Fund in memory of:

Sister Mary Junilla, a past treasurer of the SOCIETY
Robert Cathcart, a past secretary of the SOCIETY
Jean Flack, a former hospital pharmacist in Cleveland.

It would seem that such a scholarship fund could be perpetuated very well through contributions in the memory of others.

EVLYN GRAY SCOTT, *Chief Pharmacist*

St. Luke's Hospital
Cleveland, Ohio

From IPSF

DEAR SIRS: In the recent issue of the AMERICAN JOURNAL OF HOSPITAL PHARMACY, I noted with much pleasure your resolution entitled "Student-Visitor-Exchange Program" which was adopted at the 1959 Annual Meeting of the ASHP. It reminded me once more of how much the International Pharmaceutical Student's Federation is indebted to your SOCIETY and to the Chairman of its Committe on International Hospital Pharmacy Activities.

On behalf of the Executive Committee and members of the IPSF, I wish to thank the ASHP for its cooperation and support and I would be most grateful if you would bring this to the attention of your Executive Committee.

C. GLEN MOIR, *President*

International Pharmaceutical Student's Federation
Faculty of Pharmacy
University of British Columbia
Vancouver 8, Canada

Appreciation from Author

DEAR SIRS: . . . My sincerest thanks for the way in which publication of my article entitled "Extending Pharmacy Service in The Hebrew Home for the Aged," appeared in a recent issue of the JOURNAL. It is indeed rewarding to see it so well planned . . .

JOEL YELLIN, *Chief Pharmacist*

The Hebrew Home for the Aged
5901 Palisade Avenue
Bronx 71, N.Y.

Appreciates Journal

DEAR SIRS: I certainly wait for the monthly issues of the AMERICAN JOURNAL OF HOSPITAL PHARMACY. It is an excellent journal and our faculty makes good use of it in teaching.

AL PICCHIONI, *Professor*

College of Pharmacy
University of Arizona
Tucson, Arizona

Reprints Requested

DEAR SIRS: We would be most interested to read your paper "Some Considerations in the Preparation of Pharmaceutical Abstracts." I wonder therefore if you would be kind enough to forward us a copy. This would be of great assistance in our library work.

J. CLEMOW

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editorial

by DON E. FRANCKE

What Price Success For The ASHP

► TO SUCCEED IS TO ATTAIN THE DESIRED OBJECTS or ends and success is the degree or measure of succeeding. Measured by any yardstick, the ASHP has achieved a good measure of success in its fifteen years of existence. Continued progress, however, depends upon continued efforts. As Dean Jenkins of Purdue said some time ago, "Plans are not simply drawn and executed; they are evolved and carried to fruition by sustained and persevering enthusiasm and toil." The secret of the ASHP's success has been the fact that its officers, committees, Affiliated Chapters, and an unusually large proportion of its individual members have worked with sustained and persevering enthusiasm. Preceded by good and careful planning, such efforts could not but have resulted in considerable progress.

But a professional organization never achieves final success in the sense of attaining an end or reaching a terminal point. It only moves toward goals which tend to shift or be modified as new concepts and new circumstances are accompanied by creative thinking and planning. The next ten years will witness many advances in hospital pharmacy practice and this specialty of the profession will become increasingly attractive to a large number of graduates in pharmacy. There are a number of factors which will demand the considered attention of those responsible for charting the future course of the ASHP as it strives to improve the qualifications and usefulness of hospital pharmacists that they may better serve the patient, the hospital, and the members of the allied health professions.

For example, the ASHP must continue and expand its interest in the education of hospital pharmacists. The newly established Joint Committee on Hospital Pharmacy Education of the ASHP and the American Association of Colleges of Pharmacy has several years of hard work ahead of it. However, even though agreement on an educational program be reached, tangible results may not follow for ten, twenty, or more years. This, too, is one of the prices of success.

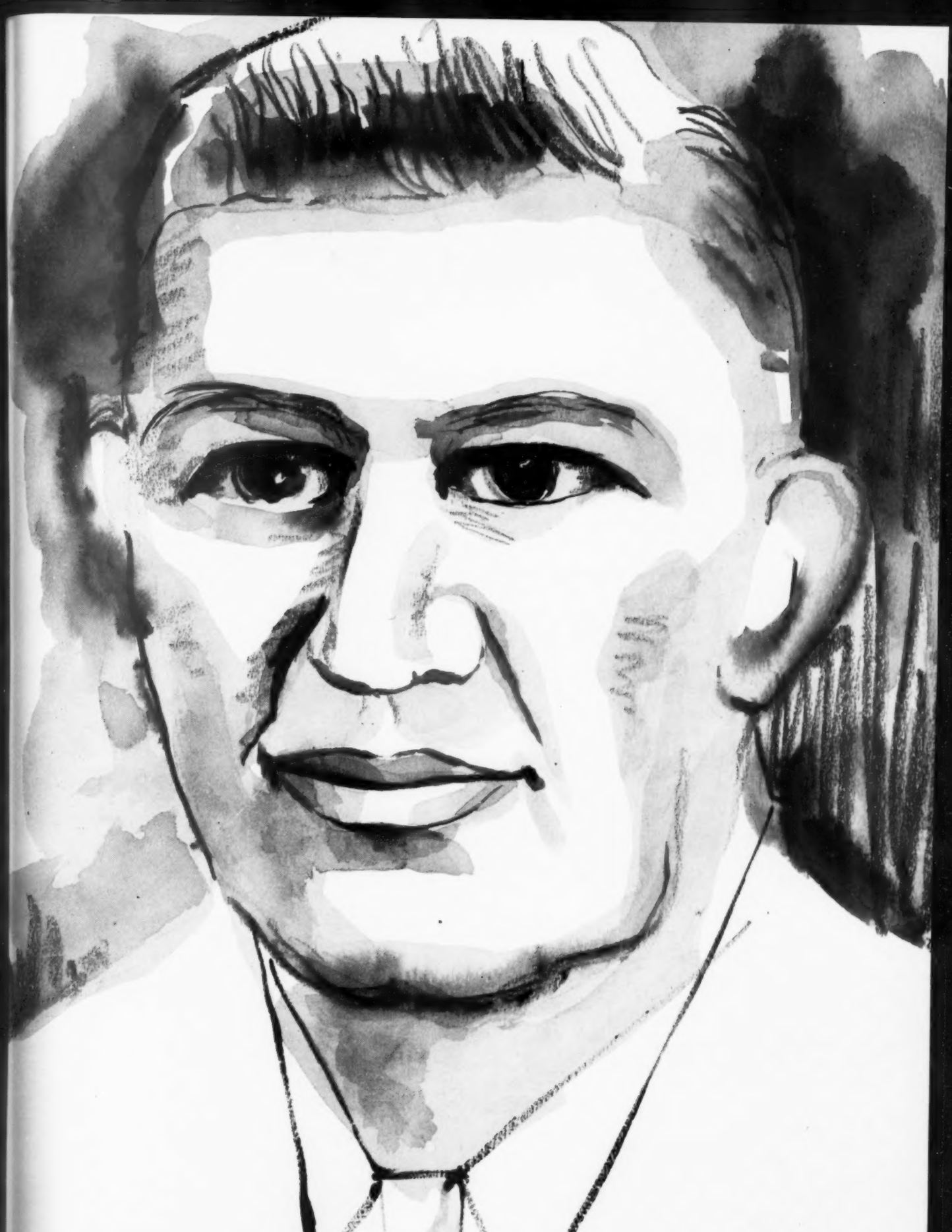
The training of hospital pharmacists through an increase in the number and quality of internship programs is a second area which is fundamental to the advancement of hospital pharmacy. Considerable progress has been made by the ASHP in encouraging the establishment of internships. Perhaps the greatest need now is an accreditation program which would stimulate an improvement in all aspects of internship training by providing helpful aids and consultation. Such an accreditation program would inevitably lead to the establishment of additional internship programs. These are greatly needed because only a small percentage of those entering hospital pharmacy practice have had the advantages of specialized training in this area. It is anticipated that the Division of Hospital Pharmacy will begin the internship accreditation program early in 1960.

As a national professional organization, the ASHP has never entered directly into the salary question although the Division of Hospital Pharmacy, through its employment service, may have some subtle influence on salaries offered to hospital pharmacists. We are not suggesting that either the ASHP or the Division play other than an advisory role in this matter. Still, good education and training for hospital pharmacists unaccompanied by proper pay will not result in the staffing of hospitals by topflight pharmacists. Individual chief pharmacists are probably in the best positions to exert long-term influences on salaries. A desirable initial goal would be to obtain for staff pharmacists a monthly take-home pay at least equivalent to that paid retail pharmacists in the same area.

In spite of the best in education, training and salaries, however, a profession really never succeeds as a profession unless its members maintain and pass on to their successors a concept of service—service to the patient, to the physician, to the administrator, to the nurse, and to others concerned with patient care. In the words of Vannever Bush, "From earliest times, this primary characteristic has been the hallmark of professional men when such men have lived up to their high ideals."

The ASHP is attaining its goals and all hospital pharmacists may be proud of their opportunity to share in its continued progress. Neither bouquets nor brickbats will alter this truth.

WHAT PRICE SUCCESS IN HOSPITAL PHARMACY



of the National Association of Boards of Pharmacy, and other top officials at that time. I was caught in the "net" by a few men who were interested in "Success in hospital pharmacy." Our Sub-Section on Hospital Pharmacy in the A.Ph.A. was born.

Mordell Tells Story

At the annual A.Ph.A. meeting in Minneapolis in 1938, one of the featured speakers for the sessions was unable to attend, and Dr. E.F. Kelly, a wise gentleman of the old school had heard that one of our hospital pharmacists, J. Solon Mordell, from the Pharmacy Department of Syracuse University was a good speaker. With less than 24 hours notice Jack Mordell appeared at the General Session of the A. Ph.A. and told the story of hospital pharmacy. He spoke of the needs of our group and the responsibilities and possibilities and his talk was the top one of the Annual Session.

Hospital pharmacy was off to a good start from the point of interest, enthusiasm and possibilities of organization. I had prepared a paper about our work at the Duke Hospital Pharmacy for the New York meeting in 1937 and was flattered at the attention I received. I was elected chairman to preside at our meeting in Atlanta, Georgia in 1939, and I well remember asking for funds to help defray some expenses that would be incurred. Dear old Dr. Kelly told me that we could possibly get a contribution of $25.00 from the A.Ph.A., if I thought that would be of some help. Needless to say I took the money and had the thrill of seeing my name in print on our official stationery.

Harvey Whitney was not satisfied with slow growth. He wanted more activity and a speedier accomplishment of our total needs. At our meeting in Atlanta in 1939, we had a display of pictures of equipment contributed from hospitals whose hospital pharmacists I had met in my travels. I had the opportunity to go to the West Coast in 1938 to see our Duke team play football in the Rose Bowl. I visited hospitals in Chicago, San Francisco and Los Angeles and when I told Harvey about my idea for pictorial display which, of course, included his own hospital at Ann Arbor, New York hospitals and the Baltimore area group, the Charity Hospital of New Orleans, with Albert Lauve, whom I visited in 1936 enroute to Dallas—Harvey's eyes lit up with satisfaction and he commented, "Why can't we go a step farther—why don't we put these folks to work—why don't we organize a 'Corresponding Society of Hospital Pharmacists'?" We talked to Don Clark of the New York Hospital, Ben Howiler of the University Hospital in San Francisco, Jack Morrison from the University of Illinois Research Hospital, Eldon Roberts from the Medical College of Virginia at Richmond and, later, to Roger Lager of the Lakeside Hospital in Cleveland, Louis Hickenall of the Cleveland City Hospital, who, Harvey commented, were to be found on the home grounds of that educator to whom we all owe a great deal, Dean Edward Spease of Western Reserve University.

Shortly thereafter, the following confidential release was sent to a small group of active hospital pharmacists.

Memorandum

CONFIDENTIAL

It is hereby proposed that there be formed a corresponding society of hospital pharmacists for the purpose of interchanging ideas, routines, formulations, and any other interesting or critical observations that might develop mutual benefits of any nature.

It is further suggested that the membership in this society be restricted to the active roll of members of the A.Ph.A., and loss of membership in the A.Ph.A., implies a loss of membership in the society.

It is proposed that membership in this society be by election by the several incorporating members or their duly appointed representatives. Membership in the society implies an active interest, for example, the submission at frequent intervals of ideas or observations through a corresponding secretary.

It may be suggested that the society actively interest itself in standardizing the hospital formulae. It is not unlikely that observations may be agreed upon, and, this information may be of such character of value that will permit its being passed on to the Revision Committees of the United States Pharmacopeia and the National Formulary.

A further suggestion would be that the society could actively interest itself in the evaluation of new drugs being offered for investigational use. A cooperative endeavor in this direction would certainly reflect to the credit of the several members of the society.

Further, some proposition might be entertained such as taking an active part in columns of these publications that are now engaged in presenting articles on hospital pharmacy. It may be presumed that such activity may be in the manner of submitting comment on published articles, or the publication of articles by the several members, or perhaps with the consent of the society. To further create an interest it is also suggested that the several members take the responsibility of addressing themselves personally to the authors of particularly interesting and pertinent articles favoring hospital pharmacy.

It occurs to this proponent that the adoption and use of an appropriate name for the society might be considered. A name such as the *Corresponding Society of Apothecaries* would very well lend itself to the adoption of individual signatures, such as John Smith, C.S.A. Perhaps the curiosity developed through the recurrence of several such signatures of this order might very well provide a desirable impetus toward the development of a rather fecund society. The maintenance of a degree of secretiveness in divulging its character might well lead to some interesting results in furthering membership.

The feeling obtains that this society might very well be kept small in number during this formative period until the organizational detail can be thoroughly worked out. Accordingly only a small number of individuals are being approached and I feel the list is rather select because of my intimate knowledge of the individuals concerned. Furthermore, I feel that they are a particularly fertile group and for this reason I am earnestly soliciting your most candid criticism of this proposition. While this outline is somewhat sketchy, I believe you will understand what I am trying to accomplish.

Signed: H. A. K. Whitney

Forum of Hospital Pharmacists

As a result of the messages received from the C.S.A. the name of this group of letter-writers was changed to "Forum of Hospital Pharmacists" with Harvey Whitney, as usual, supplying the secretarial energy.

In his Bulletin No. 1, he expressed the following opinions:

> 1. You can see by the heading the title having the greatest appeal to those voting (of which there is more later). It is relatively unimportant to our cause to attempt to make out a case for any one title, all are respectable, and probably none will stand strict interpretation on the basis of derivation alone. In the main the name will satisfy our purposes and it is to be hoped its existence as a professional tool will be justified by our subsequent interest.
>
> 4. This leads up to the proposal of another name for membership, that of Mr. Robert Emmett Church, B. S. Pharm. 1938 (Michigan). Mr. Church served his internship here and had just acceded to the post vacated by Griggs. I believe he will be a worthy addition to our "family" and should bring us the stimulating freshness of youth (and I might add inexperience if Church isn't listening). I am inclined to this latter facetious remark because my own experiences have taught me it is usually revealing to have some one ask "why do you do something this way or that?" It is one sure way to keep in the van for too often we "acquire" a tradition of routine and develop "apothecaries astigmatism."

Harvey asked all of us for a contribution on the following subjects to be printed in the next issue of his F.H.P. Bulletin:

> . . . "Subjects for descriptive report:
> 1. Home-made "GEL-CAPS" or binders for serum-bottles, etc.
> 2. Adhesive-remover used.
> 3. Experiences with manufacture of pollen extracts, vehicle used, etc.
> 4. Experiences with manufacture of Alumina-gel (Aluminum hydroxide)
> 5. Experiences with manufacture of "Hydrophilic Bases," with particular reference to elements involved.
>
> 6. As modestly as possible your Secretary remarks his election to the Sub-Committee of External Preparations of the N.F. Revision Committee. I am happy to report the selection of Howiler (California) to an Auxiliary Committee for the same group. This "advertising" is meant simply to solicit all of you to work off some "pet peeves" or "pet formulae" by submitting remarks, comment, criticism or formulae to your Secretary. Who knows; we may find it desirable to accept "Morrison's Mucilage," "Clark's Cerate," "Lager's Lager" or even "Reamer's Reamer" might be inserted in the next N.F." . . .

Harvey A.K. Whitney was paying the price for success in hospital pharmacy.

He was thinking, reading, writing, being friendly, dreaming, worshiping and working.

Not everyone agreed 100 percent with Harvey at all times. Jack Mordell commented regarding the contemplated Corresponding Society, "Weren't the aims of this group as outlined by you, the original basis for the organization of the Sub-Section?" "Yes," Whitney answered, ". . . but don't think harshly of me . . . the intimacy I'm attempting to develop with this group, an intimacy you suggested we foster by round-table discussion, has not seemed possible of realization. Recall too, JS, that not all of us can get together year after year and correspondence will lag for want of specific stimulation." Whitney further commented that he hoped that all of this should lead to an increased interest and activity in the A.Ph.A. ("They are always in need of papers," he said.)

Unmet Needs

The seeds planted in the thirties have grown and prospered during the forties and fifties but, in some ways, we see the glaring faults that stare us in the face. We know that our membership growth from 100 or so charter members to almost 3,000 reflects a lot of doing. We also know that our Minimum Standards, and Institutes and Seminars, our Educational and Internship program, Research and Development, Public and Professional Relations and Long Range Planning, all of these are on the plus side. But we still need and should demand much more than has been accomplished. Our personnel standards are not what they should be, our educational background needs expansion, our physical plants need overhauling, our salary demands leave much to be desired. Our story and needs are reaching the young administrators who are being trained at this period, but our efforts have not met with proper success in influencing the older group of hospital administrators.

Making Hospital Pharmacy Attractive

What does a dean of a school of pharmacy think of us? Dean Sprowls of Temple University in Philadelphia, Pennsylvania had this to say at a Seminar last year.

> "The question really is this: Will hospital pharmacy continue to attract a fair share of the available graduate students? Here the future does not seem too bright. Large numbers of young men cannot be expected to enter hospital pharmacy as a career when the number of worthwhile positions which exist in the field are numbered, perhaps, in the dozens. So long as hospital administrators fail to recognize the services which a well-trained pharmacist can provide, and so long as they think of hospital pharmacy salaries on the same level as those of technicians, so long as law enforcement agencies permit a lower standard of pharmaceutical service in some hospitals than that required at the retail level, this condition will prevail. We must do everything we can individually and collectively to upgrade the position of hospital pharmacist both salary-wise and position-wise; for, only in this way can hospital pharmacy be made sufficiently attractive to be elected by the most qualified students. For those now in hospital pharmacy a special challenge exists. They must make worthwhile contributions through their work so that their value will be recognized, and so that others will be motivated to follow in their footsteps."

Volume Dispensing

I did not realize before I read Dr. Sprowls' contribution what our total responsibility was in relation to our working force. We dispense, he said, 30 percent

of the total distribution of ethical pharmaceuticals. We also do this with less than 5 percent of the nation's pharmacists. I started thinking about the distribution of drugs in my own hospital and came up with the following astounding facts. My four registered pharmacists dispensed an ethical drug volume equal to that of all the twenty drug stores of our city of Durham, where at least forty pharmacists are employed. We have the responsibility, we do it with a minimum of help and at the lowest salary level. Salary-wise 10 to 30 percent lower—and responsibility-wise double or more. We not only have the larger volume, but we accept the responsibility of manufacturing mouth wash, soap solutions, eye solutions, parenterals such as dextrose, saline, procaine, etc., package capsules, bulk ointments, etc., teach nurses and physicians, prepare formularies, etc.

Success in our profession will not follow our footsteps by complaining. It is not unfashionable though to complain. Our own Medical Director, Dr. W. C. Davison, when he made his thirty-year report to the President of Duke University, Dr. Hollis Edens, had this to say. "In our dissatisfaction with the Present — we have no Peers." He also commented in his report, "The only rooms serving the 1930 original purpose are the toilets and the amphitheatre — the cost of plumbing charges has stabilized the former and a hydrogen bomb would be needed to move the solid concrete of the amphitheatre."

How many hospital pharmacies need remodeling? Are we equipped to keep the inventory properly? Do we have air-conditioned rooms to protect our supplies? Do we have large walk-in type refrigeration units so that economies can be effected in large volume purchase of parenteral antibiotics? Many questions enter our mind when we think of some method of checking our work and our facilities to find out if we qualifiy as good hospital pharmacists. Do you enjoy your work? The following story implies that a job is what we make it.

Remember the old story of the man who approached the three construction workers and asked them what they were doing? The first man sighed, "I am laying brick." The second snapped, "I'm working my arms off for two dollars an hour." But the third man's face lighted up as he said, "I'm helping to build a cathedral."

Self-Rating Chart

A recent issue of Lilly's *Tile and Till* contained The Hospital Pharmacist's Self-Rating Chart. If you can pass this test with a high rating you will know that you are a success in hospital pharmacy. I will list the 25 questions and the answers are up to you.

The Hospital Pharmacist's Self-Rating Chart

1. Do you conscientiously try to dress as a professional man should?
2. Are you ever asked to address groups in your hospital on professional subjects?
3. Are you a member of the therapeutics committee in your hospital?
4. Do you have an organized and up-to-date formulary?
5. Do you have a statement of pharmacy policy in written form?
6. Is it distributed or made available to all departments in your institution?
7. Do you regularly inspect drugs and medications in ward cabinets and other areas outside the pharmacy?
8. Do you have an organized file of company literature on new drug products?
9. Do you belong to the American Pharmaceutical Association?
10. Do you belong to the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS?
11. Do you belong to a state or local professional group?
12. Have you attended a professional meeting in the past year?
13. Do you have any kind of regular conference with your administration?
14. Do the staff physicians request much information from YOU?
15. Do you get what you consider satisfactory cooperation from the nursing staff?
16. Was your last salary increase given to you without your asking for it?
17. Have you found any errors in orders for medication in the past week?
18. Do you have a system for recording proof of use for hypnotics?
19. Do you have an up-to-date inventory of your pharmacy stock?
20. Are you familiar with the minimum standard for hospital pharmacy set up by the ASHP?
21. Do you have up-to-date reference books in your pharmacy?
22. Do you enjoy your work?
23. Do you have an accurate accounting system?
24. Does your pharmacy run efficiently when you are not around?
25. Do you have adequately trained help?

Did you fail to answer "Yes" to more than five? If so, use this as a guide to professional improvement.

Service Is Key to Success

It is obvious that we do not rate a hospital pharmacist a success because of the profit he might show by having only an excellent financial record. Service is the key word to our success, service to the patient, the doctor, the nurse, and the administrative staff.

We do not always receive 100 percent cooperation from our staff when we try to make changes to overcome obsolete practices. I can recall when our first formulary was being worked out some years ago and we tried to elimate some old-fashioned names such as Ward Cough Mixture, Schlesinger's Solution, Bladder Mixture, etc. Our committee voted to change Bladder Mixture to H.P.C. Solution which of course, was an abbreviation for Hyoscyamus and Potassium Citrate Solution. Within a few days I received this note: "Dear Tom: I do not mean to continue our little argument, but I disagree with you thoroughly that H.P.C. is a preferrable name to Bladder Mixture. Bladder mixture at least denotes that it is a mixture we hope will help the bladder. H.P.C. could be a new

government agency to help migratory birds get to Saskatchewon."

We, in the pharmacy, also try to get our physicians to make some changes to improve service to the patient. One area in which we have failed to improve what I believe to be an unsatisfactory situation is the Investigational Drug Policy. The American Hospital Association has made a statement of principles which should be followed. These principles are as follows:

a. Investigational drugs should be used only under the direct supervision of the principal investigator who should be a member of the medical staff and who should assume the burden of securing the necessary consent.

b. The hospital should do all in its power to foster research consistent with adequate safeguard for the patient.

c. When nurses are called upon to administer investigational drugs, they should have available to them basic information concerning such drugs—including dosage forms, strengths available, actions and uses, side effects, and symptoms of toxicity, etc.

d. The hospital should establish, preferably through its pharmacy and therapeutics committee, a central unit where essential information on investigational drugs is maintained and whence it may be made available to authorized personnel.

e. The Pharmacy Department is the appropriate area for the storage of investigational drugs, as it is for all other drugs. This will also provide for the proper labeling and dispensing in accord with the investigator's written orders.

We are asked embarrassing questions when we are not included within the framework of a policy which is a sound one only when the pharmacy department is included according to the policy as stated.

Parenteral fluids were manufactured in an area other than the Pharmacy when I arrived on the scene at my hospital. When difficult times were encountered we accepted the responsibility for their manufacture.

Laboratory stains and reagents were taken care of for a period of time outside the Pharmacy. When we were asked to assume this responsibility, we accepted the challenge.

Later on we were asked to assume the responsibility of screening all chemical orders for all the research laboratories and governmental research projects so that the job of the purchasing agent would be much simpler, we accepted the challenge.

The point that I wish to convey is that we should at all times be ready to accept the challenge of increased responsibility within our hospitals.

Changing Times

In a recent issue of *Southern Hospitals,* June 1959, I read an interesting story of success. It was about a pharmacist whom we all know. He was good at folding powders, he knew the doses for morphine and codeine, he could turn out an excellent suppository, he could tell a good story, he was well-versed in the law of pharmacy. But, he knew nothing about the sulfas, penicillin, cortisone or polio vaccine. I will hold you in suspense no longer, his name was Dr. George Archambault. Alas, the year I refer to was 1931. George has climbed the ladder of success by making a study of every facet of our profession; he has traveled, studied, lectured and has given his life to the improvement of hospital pharmacy whenever and wherever possible. There are many other success stories that I could bring to your attention. Dr. Archambault does not need my help to make you aware of his accomplishments; but another story needs to be told.

Search for Professionalism

Early in the summer of 1925 I became tired of filling 25 to 30 prescriptions a day in a retail drug store, my hand was becoming blistered dipping ice cream for children who flocked into my store because the "Boss" liked to run specials "2 big cones for 5 cents," a chocolate sundae for 6 cents, I could not become accustomed to a 12 hour day of work. I wanted a more professional outlet for my training in pharmacy. When I mentioned the possibility of getting a job at the Johns Hopkins Hospital my boss informed me that in a hospital you merely poured from the big bottles into the little ones. I refused to believe him. I visited Mr. Robert S. Fuqua, Chief Pharmacist at the Johns Hopkins Hospital, and he accepted my application. The challenge of hospital pharmacy was ahead of me. I had to learn bulk compounding; soap solutions, parenterals, ointments, tooth paste, laboratory stains and reagents, etc. Robert S. Fuqua came to work a bit late in the morning, perhaps 9:30 to 10 A.M., but he always put out the lights at night and stayed on until 10 P.M. or later most of the evenings. Bob always wanted to improve his formulae, he wanted to make sure that all the techniques used were the best, he was continually making up a "batch" of special solutions for research projects for higher staff physicians.

In 1931 when the opportunity came for me to take over at Duke University, he drove 350 miles over rough roads with me to Durham to look over the new hospital. He helped me draw the plans for all the cabinets needed, he did all in his power to see that I had the proper information to give the best professional advice and when I wrote back to him for additional help, he always responded. My feeling tonight is that whatever honor is bestowed upon me I can thank Bob Fuqua for starting me out in the proper attitude and frame of mind to pay the price for success in hospital pharmacy.

There are many others to whom I owe so much, Dr. W.C. Davison, the Director of our Hospital; who is retiring next year, for his wonderful cooperation over the past 28 years, to Don and Gloria and all the wonderful people who make up the ASHP. I could say that I have given a little of myself and whatever talent I may have possessed, but I received so much more in return. I also wish to thank the Michigan Society for having made this wonderful evening possbile.

implementing the pharmacy recommendations of the JOINT COMMISSION ON HOSPITAL ACCREDITATION

by LOUIS P. JEFFREY

► IN 1918, THE AMERICAN COLLEGE OF SURGEONS inaugurated a Program of Hospital Standardization. The purpose of this approval program was "to advance the practice of surgery." Since some of the requirements of admission to the American College of Surgeons was contingent upon hospital records, practices and procedures, which were deficient from the standpoint of scientific efficiency, the need for over-all improvement was evident. Subsequently, minimum standards for various hospital departments were developed. Thus, we see what started out as an effort to improve surgery, had developed into a program aimed at improving hospital standards.

Several years ago, the American College of Surgeons indicated that it would be desirable to transfer this accreditation responsibility to some other group. In 1952, an independent, voluntary, non-profit corporation was created to assume the responsibility of the approval program. That corporation is the Joint Commission on Accreditation of Hospitals. Initially directed by Dr. Edwin L. Crosby, who was succeeded in 1954 by Dr. Kenneth B. Babcock, the Joint Commission represents four medical and health organizations and at the present time has a board of twenty commissioners. They are as follows:

American College of Surgeons	3
American College of Physicians	3
American Hospital Association	7
American Medical Association	7

Up to January, 1959, the Canadian Medical Association was a member of the Joint Commission and was represented by one commissioner. The Canadian group has now withdrawn its affiliation and is developing a similar accrediting body.

Standards for the Pharmacy or Drug Room

The Standards for Hospital Accreditation list the following as necessary:

1. There shall be a pharmacy directed by a registered pharmacist or drug room under competent supervision.
2. Facilities shall be provided for the storage, safe guarding, preparation and dispensing of drugs.
3. Personnel competent in their respective duties shall be provided in keeping with the size and activity of the department.
4. Records shall be kept of the transactions of the pharmacy, and correleated with other hospital records where indicated. Such special records shall be kept as are required by law.
5. Drugs dispensed shall meet the standards established by the U.S.P., N.F., N.N.D., B.P or C.F.
6. There should be an automatic stop order on dangerous drugs.

In January, 1956, these Standards were considered and revised. As you may know, the Joint Commission describes the hospital departments as those which are "essential" to good hospital operation and those which are "complementary" and are not always required in every hospital. Prior to January 28, 1956, the pharmacy had been considered a "complementary" division. In the *Bulletin of the Joint Commission on Accreditation of Hospitals,* Dr. Babcock wrote; "The pharmacy or drug room has been included in the 'Essential Divisions.' In the former report it was in the 'Complementary Divisions.' The Board of Commissioners consider it essential that a hospital maintain a pharmacy or drug room which is satisfactorily controlled and supervised."

Recommendations and Implementation

There are essentially two recommendations and one requirement respectively, which I should like to discuss with you today and suggest a manner in which each may be implemented at your institution.

Pharmacy and Therapeutics Committee

First let me quote from the *Bulletin of the Joint Commission on Accreditation of Hospitals,* December 1957, in which the Hospital Pharmacy and Therapeutics Committee is recommended:

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Presented March 17, 1959, at the Pharmacy Congress, St. John's University, Jamaica, New York.

"This committee is one tool for maintaining medical staff self government. It is responsible to the medical staff as a whole and its recommendations are subject to medical staff approval. It is not a mandatory committee of the Joint Commission on Accreditation of Hospitals, but is strongly recommended for all hospitals."

And, from the *Survey Report Form,* "There is a pharmacy committee of the medical staff."

Much has been said concerning the Pharmacy and Therapeutics Committee and to some of you, this may be repetitious. "This committee composed of physicians and the chief pharmacist serves as the organizational line of communication or liaison between the medical staff and the pharmacy department. The committee assists in the formulation of broad professional policies regarding the evaluation, selection, procurement, distribution, use, safety procedures and other matters relating to drugs in hospitals."

Dr. Kenneth B. Babcock states that the purpose and function of this committee are:

a. To serve as an advisory group to the hospital medical staff and the hospital pharmacist on matters pertaining to the choice of drugs.

b. To add to, and delete from, the list of drugs accepted for use in the hospital.

c. To prevent unnecessary duplication in the stock of the same basic drug and its preparation.

d. To make recommendations concerning drugs to be stocked on the nursing unit floors and by other services.

e. To evaluate clinical data concerning new drugs or preparations requested for use in the hospital.

f. To develop a formulary or drug list of accepted drugs for use in the hospital and revise such formularies or drug lists as often as necessary.

The implementation of this recommendation should not be difficult. The ground work in initially paving the way for this committe has been established with your administration. Invariably, they are anxious to comply with recommendations of the Joint Commission. If such a committee has not been established at your institution, it behooves you to assume the initiative and discuss this with your administrator. Properly presented with an intelligent approach, your recommendations will be appreciated and approved. The committee should consist of 3 to 5 or 7 members including the chief pharmacist, who should serve as secretary of the committee. The committee should meet at least twice a year. Although this is not a requirement of the Joint Commission, it is highly recommended.

Formulary or Drug List

Second, let us discuss the hospital formulary or drug list and begin with two quotations from the Joint Commission. According to the Survey Report Form of the Commission, "A formulary or drug list is kept current."

Clarification of the requirements regarding formularies or drug lists is made in published correspondence of the Joint Commission:

"Usually a formulary is considered to be a comprehensive procedure book such as is used or issued by large teaching hospitals. This is certainly a goal to be sought and is considered part of the armamentarium of such an institution. However, in smaller hospitals, this might be unnecessary and not feasible. In the latter, a drug list is all that is required. This list should be amended at regular intervals by the pharmacy committee of the staff with the cooperation of the pharmacist (consulting or otherwise) and the administration."

The use of either of these publications is familiar to most of you. Dr. William M. Heller describes the formulary as "a book or booklet listing those drugs and dosage forms, together with any additional information about the drugs, their use, their distribution within the hospital, and other matters related to drug therapy." In discussing the formulary, its use and implementation, I think that this can be best exemplified by the use of the *American Hospital Formulary Service.* Recently, 6,000 to 7,000 copies of the *Formulary Service* have been distributed. This formulary contained initially 605 drug monographs listing 1,667 preparations in loose-leaf form. This *Service* is not expected to be used in the form in which it is distributed. Rather, the intent of the *Formulary Service* is to prepare monographs for ethical drug products. The subsequent distribution of these monographs will enable the medical staff, represented by the Pharmacy and Therapeutics Committee of each hospital, to select those drugs which are acceptable for general use in that institution. The mechanics of the operation of each committee may vary, but essentially the chief pharmacist, whom we said would act as secretary, and the other members of the committee, shall recommend to the medical staff the drugs and preparations which they consider most effective. If your institution already has a current formulary, but if you wish to adopt the *Formulary Service,* you need only to remove from the recently distributed *Formulary Service* those drug preparations which have *not* been accepted by your medical staff. Then, a formulary, with the forms of those drugs available from the pharmacy underlined or checked, would be distributed to each nursing station. If you have no formulary system at the present time and if you wish to implement one through the Pharmacy and Therapeutics Committee, a suggested procedure would be as follows. Submit to each of the chiefs of staff or to the department heads of the various services—such as medicine, surgery, pediatrics, anesthesiology—a list or outline of the drugs which are available for the use of his department as prepared by the

Formulary Service and supplemented, if necessary, by the Pharmacy and Therapeutics Committee. For this purpose, I should like to mention that there is available an "Outline of Drugs Included to Date in the *American Hospital Formulary Service*" which may be used as a voting form.* This could be sent out and then submitted by the members of the medical staff to the Pharmacy and Therapeutics Committee. Those monographs which were approved would remain in the formulary and the other pages filed. Since monographs for *all* drugs commercially available will not be supplied for various reasons, monographs may be prepared specifically for these drugs by each institution's committee. Since the formulary system is a dynamic one, you should file all unused drug monographs. They may be inserted into the formulary at some future time, in the event the medical staff approves the use of a new agent.

Automatic Stop Orders

Finally, let us consider the automatic stop order. The requirement of an automatic stop order on dangerous drugs appears in the "Standards for Hospital Accreditation." It states simply that "There should be an automatic stop order on dangerous drugs." The reason for this requirement is that the Commission desires that dangerous drugs especially, be given properly with reasonable medical staff controls. Many drug orders are allowed to run for a considerable period of time due to oversight and/or neglect. This practice can be dangerous to the patient in many instances, as well as expensive. I should like to cite two classic examples whereby automatic stop orders might have prevented mishaps.

1. A case occurred where ergot was given every 4 hours and the drug was not stopped until gangrene set in. The result was the amputation of three fingers and a law suit. The physician stated that he only intended to order the drug for 24 hours. He did not write this down; the nurse did not call it to his attention.

2. A second example is an instance of a patient receiving bishydroxycoumarin with resulting death because it was given for days longer than had been the intent.

The development of a policy concerning automatic stop orders on dangerous drugs may be implemented as follows:

1. Request the hospital medical staff through the medical director, to establish a written policy that all dangerous drugs, not specifically prescribed as to time and number of doses, be automatically stopped after a reasonable time limit. This limit would be set by the staff. For example, at our medical center, there is a 120 hour (five day) automatic stop order on antibiotics, a 48 hour automatic stop order on narcotics, barbiturates and sulfonamides. The ideal policy would be to have an automatic stop order on all drugs at the end of 7 days.

2. Develop a form for use at the nursing station upon which will be recorded each day the dangerous drugs that are to be terminated on that day. Each morning during rounds, the physician may check this form, and then he may renew any orders that are scheduled to be automatically terminated.

Some of the drugs which may be classified under the various classifications for the automatic stop order on dangerous drugs are as follows:

NARCOTICS

Morphine	Dihydromorphinone
Meperidine	Levorphan
Codeine	Alphaprodine
Dihydrocodeinone	

SEDATIVES

Chloral Hydrate	Phenobarbital
Paraldehyde	Ethchlorvynol
Pentobarbital	Glutethimide
Secobarbital	Methylparafynol
Amobarbital	Ethinamate

ANTICOAGULANTS

Bishydroxycoumarin	Biscoumacetate
Heparin	Warfarin

ANTIBIOTICS

Penicillin	Erythromycin
Streptomycin	Novobiocin
Tetracycline (and other forms)	Neomycin
Chloramphenicol	Oleandomycin (and other forms)

This list is here merely to illustrate an example. It could include such other groups as steroids, diuretics, etc.

Summary

Today, we have discussed the implementation of three specific recommendations of the Joint Commission on Accreditation of Hospitals.

1. Pharmacy and Therapeutics Committee
2. Hospital Formulary
3. Automatic Stop Orders on Dangerous Drugs

The efforts and interest of the Joint Commission in behalf of the practice of pharmacy in hospitals are significant. The pharmacy department has been classified as an essential rather than a complementary department. *Bulletin* No. 16 (December, 1957) is considered as a fine example of the sincere interest displayed toward pharmacy. The Commission sets standards and requirements but we have to implement or assist in the implementation of these recommendations and requirements.

Progress in hospital pharmacy is measured not only by the standards established by professional organizations or federal and state statutes but, also, by current practices and procedures which are implemented and effective in promoting better patient care at each of our institutions. If each of us does his share, pharmacy will one day achieve its goal.

*Division of Hospital Pharmacy, 2215 Constitution Ave. N.W., Washington 7, D.C. Price 35¢ each.

CHECK LIST
FOR PERIODIC RATING OF PHARMACY SERVICE

► THE FOLLOWING CHECKLIST will enable any hospital to periodically evaluate its pharmacy service. Known in the field as the "Guide for the Inspection of a Hospital Pharmaceutical Service," the check list has been submitted to the Joint Commission on Accreditation of Hospitals for survey use. It has also been approved by the Board of Trustees of the American Hospital Association and the Executive Committee of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

Any administrator or chief pharmacist using this checklist to rate his hospital's pharmacy should bear in mind that larger hospitals and teaching hospitals may engage in pharmacy activities, such as offering lectures in basic pharmacology to student nurses and working with clinicians in investigational drug research, which may be beyond the scope of smaller hospitals. The checklist is not complicated, so an evaluation can be quickly made, using simple "yes" and "no" answers.

Supervision of Department	YES	NO
1. Is the pharmacy (or drug room*) *supervised* by a registered graduate pharmacist reporting to the administrator or clinical director?		
2. Is there adequate control over the department, especially over the issuance of drugs, in the absence of the pharmacist in charge?		
3. Is the department adequately staffed with professional and auxiliary personnel?		
4. Are departmental and interdepartmental conferences held periodically?		
5. Are records kept of the pharmacy transactions and correlated with other hospital records where indicated?		

*In smaller hospitals where a full-time pharmacist is not employed, this area is sometimes referred to as the "drug room."

Drug Evaluation, Selection and Utilization	YES	NO
1. Is there a Pharmacy and Drug Therapeutics Committee of the medical staff and the chief pharmacist which keeps permanent minutes and which circulates copies of minutes of its meetings to the administrator and minutes or abstracts to members of the staff?		
2. Is there a formulary or hospital drug list and is it kept current?		
3. Is a pharmacist responsible for the requisitioning and/or purchasing, preparation, labeling and control of medications including parenteral and surgical solutions and for the condition of drug inventories?		
Is the department provided with a monthly or quarterly budget?		

	YES	NO
4. Is drug inventory adequate? Is stock dated on receipt? Is there evidence of obsolete, outdated and/or deteriorated stocks?		
5. Are generic and official names used in drug labeling, the formulary and patient chart recordings?		
6. Are periodic inspections made of drugs and solutions in Central Sterile Supply and at nursing stations by the director of nursing service and director of pharmaceutical service or their representatives?		
7. Are drugs and preparations mostly *U.S.P., N.F., B.P., N.N.D.,* and *A.D.R.?*		
8. Is there an up-to-date working reference library in the pharmacy covering the subjects of pharmacology, clinical toxicology, pharmacy, microbiology, etc?		
9. Is the pharmacy inspected by the state board of pharmacy or by state hospital licensing authorities?		
10. Is a periodic review made of patients' charts (medical records) by medical members of Pharmacy Committee for inconsistence in medication prescribing (over medication in number of drugs prescribed and continuance of drug beyond a reasonable period) with report of findings made at least once annually at staff meetings, identity of cases not being revealed?		
Space, Layout and Equipment		
1. Is the location, space, lighting, ventilation and equipment of the pharmacy and its storeroom adequate?		
2. Is the required equipment list for pharmacies as promulgated by the board of pharmacy of the state wherein the hospital is located complied with?		
3. Is the general impression of the pharmacy one of orderliness and cleanliness?		
Jurisprudence		
1. Is the pharmacy (or drug room) operating in accordance with Federal, State, and local pharmacy and other (Narcotic, Hypnotic, Alcoholic, etc.) pertinent laws and regulations?		
2. Have provisions been made for the safe keeping of controlled drugs (Narcotics, Hypnotics, Alcohol, etc.)?		
3. Have provisions been made for maintaining and filing essential records on controlled drugs, in particular, Narcotics, Hypnotics and Ethanol?		
4. Are orders for legend drugs (house orders and individual outpatient prescriptions) to the pharmacy (or drug room) made in writing and kept for a period of three years?*		
5. Is there an automatic stop order on the administration of "Prescription Legend" drugs? On P.R.N. orders?		
6. Have procedures been established for the control of investigational drugs, if used?		
Safety Provisions		
1. Have safety devices such as fire extinguishers, emergency showers, or fire blankets and automatic sprinklers been provided?		
2. Have goggles and protective gloves been provided for sterile solution employees, etc.?		
3. Are flammable liquids (Alcohol, Ether, etc.) stored under conditions approved by local fire authorities?		

*A requirement of the Federal Food and Drug Administration for "Prescription Legend" drugs.

Remarks: _____

FLOOR STOCKS

their selection and control

by JAMES D. MCKINLEY, JR.

► FLOOR STOCKS MAY BE DEFINED AS ALL THE DRUGS or medications which are stored at the nursing unit, for which no charge to the individual patient is made at the time of delivery to the nursing unit. Floor stock may be divided into two broad categories:

1. *Free floor stock* includes those drugs which are charged to the individual patients, either at the time of delivery from the pharmacy or at the time of administration.

2. *Charge floor stock* includes drugs which are delivered to the nursing units in bulk, but for which an individual charge voucher is prepared at the time of administration.

Selection

The selection of floor stock will vary widely in different hospitals, so much so that no attempt will be made to present a stereotype list of drugs. The selection will depend to a great extent upon the type of hospital, whether private, governmental, teaching, general, or specialized, etc., and upon the hours of coverage offered by the Pharmacy Department. These hours, of course, depend again upon the type of hospital and the varying demands for professional coverage.

Let us first consider the selection of the "free floor stock." This is usually composed of inexpensive items, which are routinely used on a large number of patients, and which would present a burden to attempt to stock individual supplies for each patient. These would probably include such items as milk of magnesia, mineral oil, mouth wash, rubbing alcohol, hydrogen peroxide, calamine lotion, massage lotion, etc. Also found in the list, depending on the type of hospital, may be oral multiple vitamins, aspirin tablets, and A. P. C. tablets.

"Charge floor stock" includes those items which are used routinely on most patients, and therefore are easier to keep in one central stock on each nursing unit rather than in many individual stocks, but which are expensive and need to be charged to the individual patients. These charges are made at the time of administration by the nurse administering the dose, and the charge voucher is usually delivered to the pharmacy as an automatic re-order of the charge floor stock. This list would probably include penicillin, streptomycin, and combinations of these, injectable vitamins, and many of the injectable medications which are frequently used. The exact selection would have to be dealt with as an individual problem depending on the nature of the particular hospital. Many

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hospitals expand this "charge floor stock" to include many prepackaged oral doses of the expensive antibiotics, steroids, etc., and use this stock as an effective answer to the problem of supplying the patients with medications during times when the pharmacy is closed. With wise selection of drugs, a large number of the "after-hours" needs can be met with this system.

Procedure in Compiling

Now that we have defined the types of floor stock, let us look for a moment at the mechanics of selection of a list of drugs to fit the needs of any particular hospital. As has been pointed out, the selection varies so widely from hospital to hospital that it would be impossible to formulate a list which would answer all the needs of all hospitals, therefore let us examine a procedure for selecting the drugs which might compose this list.

The responsibility for initiating the list of floor stock drugs will usually fall on the hospital pharmacist. He should, therefore, using his knowledge of the needs in his hospital, prepare a list of proposed drugs for both free and charge floor stock. This list should show the name of the drug, the dosage form and strength, the proposed unit of issue, and the estimated number of units which will probably be needed for each nursing unit. This list should be mimeographed and delivered to the Nursing Office for distribution to the various nursing supervisors and head nurses. The nurses are then asked to make such changes, both additions or deletions, as they feel would be indicated. This step will cause the list to be a more practical one, since the nurses on the units will frequently offer very good suggestions as to what drugs should be stocked to make their work easier. Even if no important suggestions are forthcoming from the Nursing Service, enlisting their cooperation is import-

ant in furthering good pharmacy-nursing relationships rather than simply handing the nurses a pre-determined list which may or may not meet the needs of the nursing service to the best advantage. After the head nurses on the units have made their suggestions to the pharmacist, the edited lists should be considered by a committee composed of representatives of the Pharmacy and the Nursing Services. The final list then can be prepared for printing. Incidentally, the use of a pre-printed requisition forms is recommended, since it will clearly designate which drugs are to be ordered as floor stock and which must be ordered for the individual patient. It will also provide a good check list which the nurses can use to order their stocks more efficiently.

Responsibility

Now that the lists are prepared, and the nursing units stocked with medications, who is responsible for the maintenance of the stocks at the nursing level? In many hospitals once the drug leaves the pharmacy, the pharmacist feels no further responsibility for the storage, condition, or other factors which make up an efficient system of storage and administration of the medications to the patients. However, more and more we are coming to realize that the responsibility for control of drugs and medications rests largely on the pharmacy until the patient actually receives the medication. The pharmacist should be responsible for the storage and condition of all the medications stored in the hospital, not just those which are stored within the confines of the pharmacy. For after all, who is better qualified to determine if deterioration has occurred, or if the medications are being stored under conditions which are best suited to their stability? The routine inspection of drugs stored on the nursing units by the pharmacist can serve many purposes. Aside from the obvious reason of insuring adequate stocks of fresh drugs in good condition, the mere fact that the pharmacy is inspecting the drug stocks will frequently provide the Nursing Service with the incentive needed to do a better job of intelligently ordering and storing the drugs which are furnished to them. By keeping the stock in good order, there is always less chance for error when the drugs are administered, thereby furnishing further protection to the patient.

There is another aspect of this inspection by the pharmacist which cannot be overemphasized. That is that the inspection provides the pharmacist with a reason to go on the nursing unit and to get acquainted with the nurses. This reason is particularly important in the larger hospital where the employees do not always know everybody else who may be employed in some other department than their own. By getting better acquainted with the nurses on the nursing units, he can better understand their problems, and many of the petty grievances of both pharmacists and nurses can be resolved by the personal contact, which if kept on an impersonal basis can frequently grow into real problems in the relationship between the two departments. Far too often the only personal contact between the nursing units and the pharmacy is the telephone call to discuss dosage, or to determine whether the pharmacy stocks a particular drug. The better the nurses and pharmacists know each other and understand the problems of the other, the more harmonious the relationship between the two departments will become.

Inspection of Drug Cabinets

These inspections should ideally be made weekly. However, they are time-consuming, and until the administration of our hospitals can be convinced of the importance and will provide the additional professional assistance which will be needed, many hospitals may have to be satisfied with one inspection monthly or bimonthly. Some of the items which should be looked for in an inspection of this kind are:

1. Excessive quantities of drugs which are not being used, but which are using valuable space.
2. Out-dated or obviously deteriorated drugs.
3. Stockpiling of charged drugs which have been left by discharged patients, and which should have been returned to the pharmacy for credit.
4. Storage requirements, to assure refrigeration on items which require it, etc.
5. Determining whether there are any problems or misunderstanding about medications or pharmacy policy. These should be resolved immediately if possible. If this is not possible, then the item should be reported to the Chief Pharmacist who will attempt to resolve the problem.

These inspections should be rotated among the pharmacists on the staff, in order that each pharmacist might have the opportunity to be acquainted with the problems of the Nursing Service, and will therefore be more sympathetic to these problems. Accompanying the pharmacist on these inspections should be a nursing supervisor, so that any irregularities which may be noted by the pharmacist may be properly reported to the nursing administration, and they in turn will be in a better position to make the necessary correction of the situation.

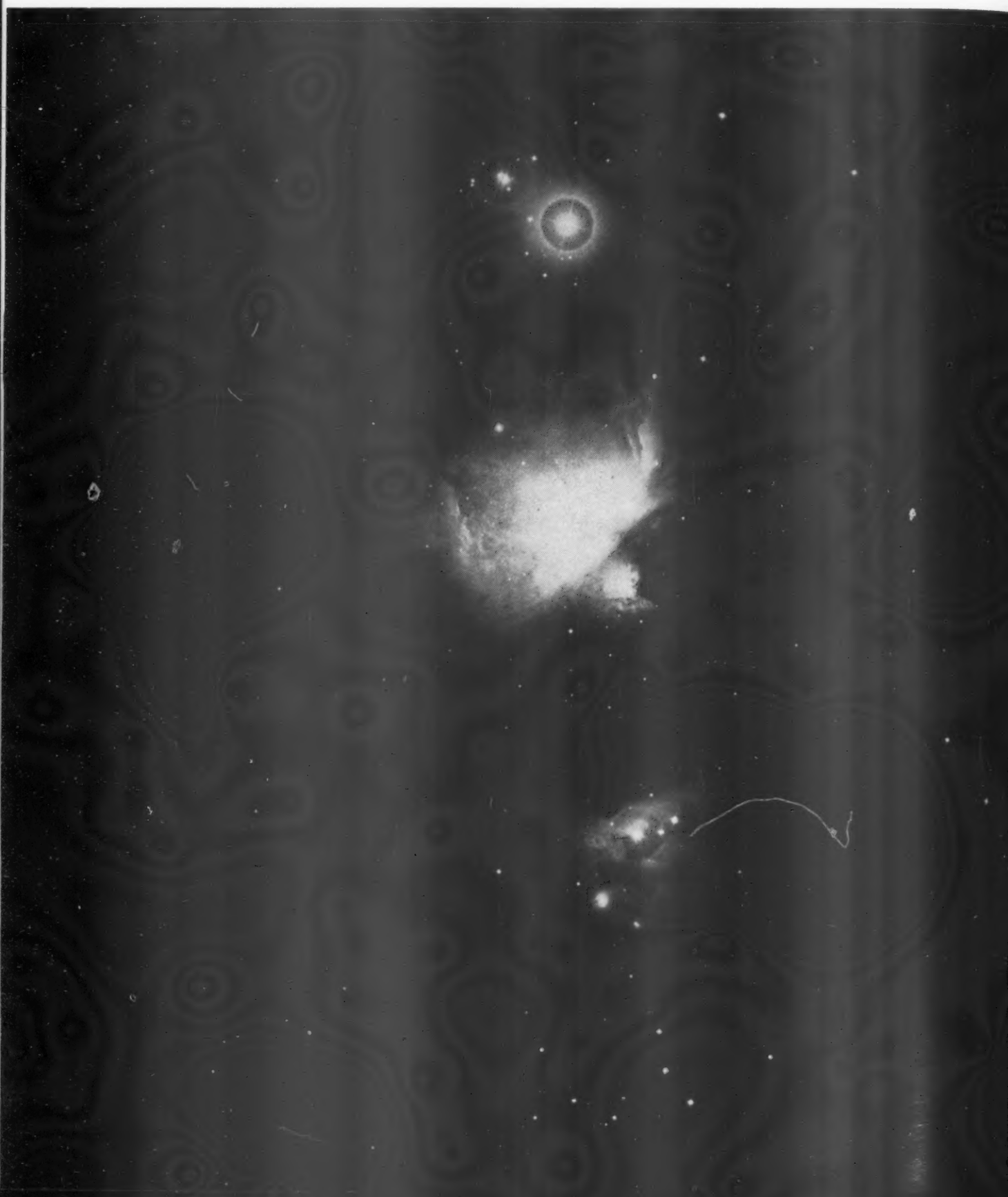
Summary

Floor Stocks have been defined and separated into two types, Free Floor Stock and Charge Floor Stock.

A system for selection of a Floor Stock List for various hospitals has been outlined.

Advantages of a regular inspection of medications on the Nursing Units by a pharmacist have been cited.

PHARMACY AND OUTER SPACE



by JOHN AUTIAN

►TODAY, MAN IS ON THE THRESHOLD OF CONQUERING space, or at least portions of space, since space is such a limitless expanse. Historically, the first successful venture, modest as it was, was conducted several hundred years ago by a Frenchman with the imposing name of Francois Pilatre de Rozier, utilizing a crude inflated balloon. This occurred in November, 1783. Not too surprising for that period of time, this French scientist and adventurer was a pharmacist. However, it has been during the last half century that the greatest advancements have been made in elevating machines and men into the immediate zone around our planet, Earth. This development was catalyzed during the Second World War when the application of rocketry for propulsion of explosive missiles became a practical reality. With rockets in hand, man was ready to break through the surrounding atmosphere into the desolate, unknown region popularly referred to as "outer space."

On October 4, 1957, the first man-made satellite was launched by the Russians, and the name "Sputnik" became a household word. Of more immediate scientific value, however, was the fact that the concept of space travel, hitherto in the minds of certain scientists and in popular science fiction stories, was definitely possible. Our own country added its first satellite nearly three months later in January, 1958. Since that momentous October 4, 1957, Russia and the United States have projected into space twelve artificial moons and two solar probes. Today (August 10, 1959), five of the twelve artificial moons still circle the earth while two man-made planets revolve around the sun. Animals have already been sent hundreds of miles into space and have been successfully recovered.

In 1958, our government conceived Project Mercury, the first manned satellite which should be a reality within the next year or so. Other space ventures are on the drawing board in this country, England and in Russia, and the competition appears to be keener as each year passes. The colossus of space exploration is very evident by referring to a recent report, *The Next 10 Years in Space 1959-69,* prepared by the Committee on Astronautics and Space Exploration of the U. S. House of Representatives. Outstanding experts in space research gave their thoughts on the immediate future of space flight. An extremely optimistic view was given by Dr. Alexander Kartveli, Vice-President for Research and Development at Republic Aviation. He predicted the following:

1. Planetary travel and landing by instrumented space vehicles by 1963.
2. Space stations or outposts for staging area to moon and other planets by 1968.
3. Moon stations by 1970-75.

To insure that man can, in fact, survive the vigors of outer space, many disciplines of science and medicine will be called upon to contribute their particular skills and knowledge. We in pharmacy must also be alert to this calling and must be willing to join the team which will be necessary for manned space travel. Already the team is quite formidable.

Of course, the question we might first ask is—What can pharmacy or pharmacy research do for the advancement of man into space? Before attempting to answer this question, it might be prudent to look at the problems which man will or may encounter in his ascent into space. An awareness of these problems may then give more fertile grounds for prophesying an answer or answers.

Physical Definition of Space

The earth's atmosphere extends to approximately 600 miles into space. At that height and above, intermolecular collisions of air particles, for all practical purposes, cease. The atmosphere, itself, has been further divided into three layers, (a) troposphere—up to seven miles, (b) stratosphere—seven to 50 miles, and (c) ionosphere—50 to 600 miles. From 600 miles outward, the general term "space" may be used. Further refinement, however, has divided the area of space into (a) exosphere—600 to 1200 miles and (b) free space—1200 miles and above.

Physiological Definition of Space

Even though, in the above physical definition, the space around the earth was conveniently categorized in exact dimensions of height, much lower altitudes are really space equivalent when man is considered. For example, at a height of 50,000 feet, man cannot sustain himself on the oxygen available to him at that height. At that altitude, the atmospheric pressure falls to 87 mm. Hg. This external pressure then is equal to the internal pressure in the body (the alveor air) and thus no oxygen can enter the lungs. At 63,000 feet, the body fluids will start to boil. The state of weightlessness can occur at heights of 100 miles when the space craft has reached a speed of 18,000 to 25,000 mph and when the space craft will take on the role of an earth satellite. In this instance, the centrifugal force

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on the vehicle will become equal to the gravitational force exerted by the earth producing a state of zero gravity. What has just been said indicates that space equivalent conditions exist at relatively low altitudes when physiological implications to man are considered.

Problems and Hazards of Space Flight

The hazard of space flight will be dependent upon the length of time man must occupy the sealed cabin which will be his home during space travel. From the time man leaves the firm surface of earth and until he returns, he will experience a variety of stresses which might be catastrophic if he is not properly acclimatized and protected. What are then some of these problems and hazards?

Acceleration

Man will be exposed to acceleration forces equivalent to 8 to 10 times the force of gravity when his space vehicle is hurtled into space. It has been found that man can survive the impact of such tremendous forces on his body if he is positioned in a transverse, front to back direction, having his trunk make a 65° angle to the extended legs. The periods of acceleration and deceleration will be tolerated but certainly will not be pleasant. Space men may experience dizziness, vertigo, headache or nausea during and after acceleration.

Decompression

Perhaps the greatest danger to man in space travel will be the possibility of decompression of the sealed cabin due to leaky seals, structural leaks, collision damage or mechanical failure within the space craft. The change in pressure (falling) within the sealed cabin might be of an explosive nature if it occurs rapidly (in seconds). If this takes place, the internal organs of the body will literally tear apart. Most likely, however, the decompression will be slow and means may be taken to seal the opening or leak. The repair must certainly be instigated promptly or else the supply of oxygen will be decreased causing hypoxia. Even if sufficient oxygen is still available to prevent loss of life, decompression sickness (dysbarism) may result.

Damage to the space ship by meteorites is possible but will depend upon the wall thickness of the cabin, frequency of collisions and time of exposure. Even though the possibility of meteorites damaging a space ship is real, the probability of this occurring is not as great as originally supposed.

Radiation

It is well-known that ionizing radiation will produce deleterious effects upon animals, depending upon the concentration, the length of exposure and the particular rays involved. Recently, high intensity radiation fields were found (referred to as Van Allen Radiation after the discoverer) at altitudes greater than 500 miles. One ring or belt appears to exist from 1400-3400 miles above the earth while a second extends from 8000-12000 miles above the earth. As yet, it has not been established whether the radiation is due to cosmic rays, solar X-rays, protons or high speed electrons. The Atomic Energy Commission considers 15.6 r (roentgen) as the maximum permissible yearly dose of radiation. It is conceivable that long flights through the denser radiation fields would cause irreparable harm to the body and death. Proper shielding of the space craft or rapid traversal through the zones should prevent serious consequence to the space men.

Weightlessness

Perhaps the most perplexing problem and as yet the least understood is the state of zero gravity. On the surface of the earth the force of gravity is 1 g ($g = 32.17$ ft./sec.^{2}) but as one travels out into space, this force is reduced inversely proportional to the square of the distance from the earth's center. At an altitude of 36,000 miles, the gravity effect will be reduced to 1/100th of that force existing at the surface. However, this does not mean man must ascend such heights for zero gravity conditions. As has been mentioned before, if a space vehicle reaches a speed of 18,000 to 25,000 miles per hour, the vehicle will become an earth satellite and will revolve around the earth in a circular or elliptical path. The distance from the earth may be one hundred to several thousand miles. In this state, the centrifugal force on the vehicle will become equal to the gravitational force exerted by the earth, producing a state of zero gravity.

In the past several years, it has been possible to reproduce a state of zero gravity by the use of a high speed airplane if a predetermined parabolic maneuver is executed. These conditions can be similated at relatively low altitudes, i.e., 17,000 to 25,000 feet. Unfortunately, the span of time for this zero gravity state lasts from several seconds to approximately forty seconds.

Since the actual time that man has been exposed to zero gravity conditions has been of an extremely short duration, much more information on the physiological and psychological aspects of weightlessness is needed. That there will be unusual and even adverse effects upon the body especially on long flights, appears to be well-grounded. Creation of gravity or partial gravity by slowly rotating the cabin has also been given as an answer to the zero gravity state, but again whether this will accomplish the results desired is only problematical and must wait further elucidation.

Oxygen Supply

Since the space cabin will be completely isolated from the outside world, oxygen must be supplied in

sufficient quantity to satisfy the body requirements of all within the space vehicle. At present, there are three main sources of oxygen. These are: gaseous oxygen, liquid oxygen and chemical compounds which may be made to liberate oxygen. Each has its advantages and disadvantages and the "best" can only be ascertained depending upon the particular trip, size of the space ship and length of travel. For very extended trips, from months to years, it may be necessary to employ plants such as a specie of algae to generate oxygen.

Removal of Carbon Dioxide

It will be necessary to remove the carbon dioxide as it is evolved from the crew. Even though concentrations of 3 percent in the air have been tolerated, there is good reason to believe that long periods at this concentration or above will be very deleterious to man. Lithium hydroxide has been found to be superior over the other alkaline metal hydroxides for absorbing the carbon dioxide. On extended flights, once again plants may be utilized to absorb the carbon dioxide.

Water: Supply and Removal

For relatively short flights, the supply of water and removal of water from human excretions will not be a critical problem. Sufficient quantities of potable water may be stored on board the space vehicle to satisfy the normal needs of the astronauts in the short flight period. On these short journeys, water may be absorbed by the use of common water absorbers such as calcium or barium oxide. Much longer flights (several weeks) will pose a problem, since storage space will be at a minimum. One answer appears to be the development of a partially closed ecological system which will recover water from the waste material being generated by the human occupants of the space craft. By far the greatest portion of this water will be supplied by the urine and waste water from washing or cleaning activities. Freeze drying, distillation, adsorption filtration, ion exchange, refrigeration and electrodialysis have been suggested to produce potable water from waste materials.

Waste: Removal

Human waste matter such as urine and feces may be stored for short periods of time, but, as in the case of water, longer trips will require other methods of removing the waste material. Even for the short periods, however, the problem of odor and its effect upon the human physiological and psychological systems in space must be thoroughly studied. At present, relatively little is known about excretion products which volatilize from the flora of the skin. Chronic toxicity may develop on extended journeys into space if the concentration of these substances in the cabin is not held down to a tolerable level.

Feeding

Proper nutrition for the personnel of space ships during flights will certainly be an absolute necessity. Poor feeding in one form or another in conjunction with anxiety, fatigue, monotony and irritation may create serious problems which in turn could precipitate a tragedy. Limitation of room and other restrictions in the confines of a space craft may create a rather unpleasant atmosphere to eat with "gusto." Studies in high speed airplanes have indicated that height often times changes the perception of taste. Thus a "good tasting food" on earth might become quite objectionable several miles above the earth. In space flight, other factors will enter to cause further changes in taste precept, one factor being the state of weightlessness. Newer methods of concentrating food in order to reduce storage space must be engineered. Conventional packaging methods may have to be altered. The meal or meals must be appealing in taste, compact in size, should contain bite-size components and should be assimilated easily. Further, the meal should be a blend of all of the necessary nutritional ingredients essential for a high state of health. Lastly, the meal must be designed to produce the least waste material after human consumption.

These meals must be sterilized and protected from putrefaction during storage, since it is unlikely that refrigeration units for foods will be available on the early space ships.

Besides water, other liquid foods may be desirable to implement the solid or semi-solid food. Here the conventional method of drinking will not be possible since in a state of weightlessness, water will not drop without some force being imparted to it. The liquid must be propelled into the body by some pressure device or mechanical conveyer. Limitation of space in the cabin will once again call for ingenious packaging designs. Food tablets and nutritional supplements will be included.

For interplanetary travel, it will be necessary to design an efficient, completely closed ecological system for regeneration of food, water and oxygen from the waste materials. The space man may actually become a miniature farmer, growing the food in the form of algae or other suitable plants. Even if this type of food service becomes practical, it will be necessary to devise flavors which will impart a degree of palatability to the green foliage.

Role of Pharmacy

It may be deduced from the previous discussion that many problems and hazards will face space man in his exploration of space. Both engineering and medical problems have been and will be created quite unlike

those now existing on earth. Already the frontiers in both fields have been pushed back, but much must be accomplished in the immediate and distant future. The success of the space program will depend on virtually all segments of the scientific and professional groups. Pharmacy must take its place and share in this great responsibility.

Medical Problems. We must realize that any advancements in the field of medical science will of necessity have an impact upon pharmacy, directly or indirectly. As yet only meager medical information is available as to the actual effects the various stresses in space will have upon man. Short and long range studies must be conducted upon animals and humans on such space conditions as:

1. Acceleration and Deceleration
2. Pressure Changes
3. Temperature Changes
4. Weightlessness
5. Radiation
6. Space Restriction
7. Atmospheric Rarefaction

In particular, it will be important to know how these various stresses impair the following physiological systems or functions:

1. Muscular
2. Nervous and Vestibular
3. Hemopoietic
4. Cardio-Circulatory
5. Gastrointestinal
6. Respiratory
7. Hormonal

From the results of the studies mentioned above, the role of medication and nutritional supplements will become apparent.

Pharmaceutical Problems. Once the specific therapeutic or nutritional agent is selected, a concentrated investigation must be conducted by the pharmaceutical group to insure that a stable, convenient dosage form of the medication is achieved. Here it should be noted that the usual "ground" (on earth) dose may not necessarily be the proper therapeutic dose in the space ship. The stresses, both physiological and psychological, may require a complete revision of many existing dosage schedules.

The physical effects imposed upon the drug products during take-off flight and return must be critically evaluated. For example, the heavy forces encountered during acceleration and deceleration may play havoc with a suspension or an emulsion, causing an irreversible phase separation. Again, the same forces may fracture an ordinary capsule or the normal formulated tablet. Temperature and humidity changes may add other problems to the final formulation of a dosage form. Hazards of radiation and the effects upon the drug product must be assessed in order to establish safe levels of dosage per unit time for each particular medication. Exactly what general or specific effects the state of weightlessness will impose on the various drug systems can only be answered by actual experimentation at zero gravity.

Even though the separate stresses (acceleration, temperature, radiation, etc.) in themselves may prove of little consequence in injuring the drug system, a combination of two or more of these conditions may create a dangerous force upon the particular drug system.

Packaging Problems. Since space and weight will be at a premium, the normal glass containers will probably have to be abandoned for the light, more versatile plastic containers. In this particular phase of product development, the pharmaceutical research worker in conjunction with package designers will have many opportunities to show creative ability. The critical aspect of storage space in space vehicles may require the development of a packaging material which can be ingested and assimilated as a nutritional product after the contents of the package are consumed. This specific material may be composed of macromolecules containing the essential amino acids impregnated with vitamins and minerals. The feasibility of such a material on a practical level may not be too distant in arriving. All of these innovations in packaging will once again require thorough testing by the pharmaceutical group to insure that the package material and drugs do not react adversely toward each other.

Need for Pharmaceutical Research

Many segments of pharmacy, from the pharmacists in a hospital pharmacy to the pharmaceutical research worker in industry, government or in research institutes, can contribute to the space program. A variety of appealing problems are and will be available to the curious pharmacist. The list below suggests a number of these problems.

1. Synthesizing new and altering existing therapeutic agents to fit the needs of space medicine.
2. Investigating the various space equivalent conditions to see how one or more of these conditions will alter the stability of the medication.
3. Developing and testing of formulations for each medication to detect the presence of incompatibilities when exposed to space equivalent conditions.
4. Investigating present common dosage forms under space equivalent conditions to select those forms which stand the rigors of outer space.
5. Designing new and specialized dosage forms to meet the various needs of space travel.
6. Helping to develop concentrated food packets, capsules or tablets containing essential nutrients.
7. Designing, developing and testing of new packag-

ing material for medications and nutritional supplements.

8. Aiding the human engineering group to devise administration units for drugs or nutritional supplements, keeping in mind the confinement existing in space cabins and the state of weightlessness.

9. Helping the food technologist create palatable food concentrates, be it dehydrated foods, algae or regenerated food from waste material.

10. Working in close co-operation with the various other scientific and medical groups when experimental formulations are needed.

11. Establishing a profile or standard for all medications, formulations and dosage forms to be used in outer space.

Summary

The impact of satellites and space travel will be felt by all segments of our society in the immediate and distant future. Technological and medical advancements from the various space programs will challenge the ingenuity of man. Pharmacy on all levels of practice will be directly or indirectly influenced by the progress being made by the other medical sciences.

In this paper, an attempt has been made to arouse interest in space programs from the point of view of pharmacy. The review of a number of basic pharmaceutical problems, even though brief, should help focus attention on what pharmacy can do to help the space program.

At present, much of the work of the pharmacy group will be primarily of a research nature, conducted on the ground at similated space equivalent conditions. Later these studies will be performed in instrumented satellites and, finally, in manned space vehicles. In the future, space pharmacists will be needed to man space stations and a number of lunar bases. Pharmacy has a most wonderful opportunity to grow in this new era of space travel. Whether it does or whether it relinquishes these activities to the other disciplines will depend upon us individually and collectively.

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a voluntary
CONSULTANT SERVICE FOR HOSPITAL PHARMACY PROBLEMS

OFFERED BY THE SOUTHERN CALIFORNIA
SOCIETY OF HOSPITAL PHARMACISTS
HOSPITAL PHARMACY ADVISORY COUNCIL

by CHARLES G. TOWNE

► THE SOUTHERN CALIFORNIA SOCIETY OF HOSPITAL Pharmacists has within its organization a standing committee that functions in an advisory capacity to its members or to the administrators and pharmacists of any hospital to assist them with the problems concerning pharmacy in the hospital.

Hospital pharmacy is definitely a specialty within the pharmacy profession; and within the hospital it is a service that requires specialized training or experience for successful operation. Since the introduction of sulfas and penicillin, the use of drugs has become very complex. Keeping abreast requires the use of every aid and much diligent study, particularly in the hospital, with the proximity to the medical teams and the more critically ill patient. Parenteral and investigational medications that are little known in the retail field are used in the hospital. The hospital pharmacist's duties have come to include the role of consultant to the staff and administrator as a major function of his position. The highly specialized information required, gathered with years of experience and study, when pooled into an Advisory Council provides an unlimited source for guidance in hospital pharmacy operation.

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The Advisory Council

The council consists of pharmacists from each of the various type hospitals. Their years of experience and educational qualifications and the extensive facilities available in their institutions are pooled to help with other hospital's problems. The members are: Walter F. Hitzelberger, chief pharmacist, Los Angeles County General Hospital; Jack S. Heard, chief pharmacist, University of California Medical Center, Los Angeles; Miss Florence L. Martin, View Park Community Hospital; Charles Hagan, Santa Monica Hospital; Melvin B. Schwartz, chief pharmcaist, Mt. Sinai Hospital; Wendell T. Hill, Jr., chief pharmacist, Orange County General Hospital; Louis J. Motta, director of pharmacy service, Kaiser Foundation Hospitals of Southern California; and the author as chairman.

Aim and Purpose

In the primary interest of better patient care through improved pharmacy service in all hospitals, this council offers its experience, knowledge, and avail-

able facilities to assist or guide hospitals and hospital pharmacists in professional and administrative problems in accordance with good hospital pharmacy practice.

Functions

A problem is referred to the member or members of the council who are considered the best authority on this particular question, who in turn recruit any or all other pharmacists of the Society experienced in the problem, or the faculty at the School of Pharmacy at the University of Southern California, with its facilities. Replies are made by telephone when adequate, or by letter, with literature, references, reprints or plans, when available. Extensive problems may require visits to the hospital by one or more members of the Council.

Services Provided

Drug Information. Through the large teaching institutions the council has available extensive therapeutic reference libraries, medical libraries, and close relations with teaching medical staffs, pharmacologists, biochemists, etc., and other outstanding authorities familiar with drugs in clinical trial. Such quick references as Unlisted Drugs, Drug Indexes, and collected formularies are also available. Experience with infectious disease control problems, germicides, disinfectants, and sterile technics can be exchanged. Sources of rare drugs, chemicals, and formulae are usually available. The large institutions compound official and special formulations at considerable economy and improved services to the medical staff. Sterilizing ophthalmic and irrigating solutions is a "must" to control infections. Guidance in such problems may be essential to meet legal and professional standards.

Pharmacy Personnel. A service whereby pharmacists, helpers, or students desiring work can register is offered under the direction of Mr. Schwartz, chief pharmacist, Mt. Sinai Hospital, Los Angeles. For requesting personnel assistance, phone OL 2-5000. Hospitals can use this service in seeking qualified pharmacists. It is hoped good staff pharmacists, after adequate hospital experience and training, can be guided to the responsibilities of chief pharmacist to mutual advantage of the individual and hospital. Pharmacists without adequate hospital background can first be placed where experiences will best qualify them for a hospital career.

Pricing Schedules and Charging Systems. A group of pharmacists from those hospitals concerned have compiled suggested procedures and schedules for pricing. They have volunteered cooperation with the Society and its Advisory Council.

Narcotic, Barbiturate, and Drug Controls. Committee members from the private and small hospitals have devised many efficient means of controlling drugs to meet the laws and requirements of the Narcotic Divisions and State Boards of Pharmacy. One of the major problems of a pharmacist in a hospital is compliance with these many complex regulations. Society members assisting other hospitals in narcotic problems has long been a voluntary intra-professional courtesy that can now be better guided by the council.

Locations of Pharmacy and Floor Plans. The importance of the pharmacy as a price source of revenue and the most frequently used service in the hospital requires its proper location and adequate floor space, arrangement, and fixtures. Experienced hospital pharmacists in the Advisory Council help with new hospital floor plans and modernizations that increase the pharmacy's efficiency and value to the hospital .

Establishing a Pharmacy Service. Some basic recommendations regarding the initial extent and type of service best suited for the hospital according to size or location can be offered, along with personnel, inventory, and operational guidance. Small hospitals with needs for limited services may be helped. Retail stores serving small hospitals may desire guidance in some problems.

Therapeutic Committee and Formularies. The Joint Commission on Accreditation of Hospitals requires that hospitals appoint Therapeutic Committees and urges the use of formularies, automatic stops on dangerous drugs, and other policy matters for improved patient care. Adaptations of these procedures vary as much as hospitals do. This Council can assist in determining the minimum needs and demonstrate their value and limitations.

Teaching--Training. Material for lectures to nurses and interns and allied groups on new drugs or metrology, etc., are available. Arrangements can be made for speakers. Intern pharmacists or formal pharmacy teaching programs can be established.

Other Problems. Policy, minimum standards, minor legislative questions, purchasing, libraries, equipment sources and other related information are within the range of aid for which this committee volunteers.

How to Request a Service. The Society headquarters are in the Pharmaceutical Association Headquarters, 701 South St. Andrews, Los Angeles, telephone DUnkirk 7-7390. Calls here will be referred to the appropriate council member. Hospitals or their pharmacists are also invited to call direct to the author at Veterans Administration Center, GRanite 8-3711, Extension 5107.

A Session of the FIP Council Meeting in Madrid

F I P
COUNCIL MEETS IN MADRID

►PHARMACEUTICAL REPRESENTATIVES OF MORE THAN 30 nations met in Madrid, Spain, 14-18 September for the meeting of the Council of the International Pharmaceutical Federation. In opening the meeting, President Sir Hugh Linstead warmly thanked the representatives of the Spanish Pharmaceutical Association for the splendid reception they had given the FIP, for the many special events they had planned, and especially for providing for simultaneous translations of all discussions into English, French, German and Spanish.

New Procedure for Resolutions

The Council adopted a new order of procedure for the General Assemblies of the FIP. This action was taken to permit representatives of the various national associations to be informed as early as possible of items to be discussed and voted upon. The rules of procedure adopted for future General Assemblies are as follows:

1. A proposition can become a resolution of FIP only in the circumstances here described.

2. A proposition (whether from a Section, Commission or membre ordinaire [national association]) may be submitted to a General Assembly to be adopted by it only if either

   a. it has been sent in writing by the Bureau to each membre ordinaire of F.I.P. at least two months before the date of the General Assembly

or b. the President is satisfied that the proposition is urgent and the General Assembly agrees to include it in its agenda.

3. Propositions contained in reports from Sections or Commissions represent the opinions of the Sections or Commissions only and their wording should be designed to make this clear. They do not represent the opinion of FIP unless the requirements of paragraph 2 have been observed.

4. When the report of a Section or Commission is presented to a General Assembly the Chairman of the Section or Commission shall propose that "the report be received."

5. The General Assembly can receive, adopt or refer to the next General Assembly a report or a proposition.

6. A report or proposition of a Section or Commission shall only be adopted by the General Assembly if the requirements of paragraph 2 have been observed.

7. A proposition cannot be received unless it is in accordance with objectives and statutes of FIP.

Scientific Section

Reporting for the Scientific Section, Professor Ruyssen (Belgium) discussed the highly successful International Congress of Pharmaceutical Sciences held in Zurich 6-11 September in which more than 500 pharmacists participated. He pointed out that the Scientific Section has as its three main objectives: (1) to establish unity in pharmacy, (2) to encourage research, and (3) to hold international congresses of pharmacy. Professor Ruyssen told of plans to hold a Symposium on Pharmaceutical Education in Copenhagen in 1960 during the meeting of FIP, in addition to the regular features of the Scientific Section.

Section of Hospital Pharmacists

President Franz Linner (Austria) of the Section of Hospital Pharmacists reported on the Congress of Hospital Pharmacists held in Vienna in June 1959 with more than 140 in attendance. Speaking of plans for the meeting of the hospital pharmacists in Copenhagen, President Linner mentioned that he hoped to be able to arrange for one meeting of the Section to be held in Stockholm, probably just prior to the Congress in Copenhagen.

Coloring of Tablets

The Council approved the following resolution regarding the coloring of medicines, agreed to by representatives of the Hospital Pharmacists' Section, the Industrial Pharmacists' Section, the Retail Pharmacists' Commission, and the Secretaries of Pharmacopeias:

"1. There can be no objection in principle to the coloring of medicaments where justified by technical pharmaceutical considerations.

"Coloring is not permissible, however, if there is a risk of its masking an alteration in the product; or if it makes it impossible to judge, from the appearance of the product, whether the medicament is in a good or bad state of conservation.

"2. It is necessary to establish lists of coloring agents whose use should be forbidden; and desirable to establish lists of coloring agents whose use can be recommended on the basis of existing scientific knowledge concerning them. The use of coloring matters not included in these lists should be subject to special precautions on the part of the users.

"The FIP hopes that the lists will be uniform in all countries, that they will be adopted internationally and, if possible, co-ordinated by W.H.O."

Commission on Abstracts

Dr. Don E. Francke, President of the Commission on Pharmaceutical Abstracts, reported results of the Commission's meeting in Berne, 3 - 4 September. The Commission (1) decided that a pharmaceutical abstract service is necessary, and (2) moved toward establishing an abstract journal which would be published fortnightly in English with titles in the original language also, contain 80 pages with abstracts printed on one side of the page for easy cutting, and contain approximately 6,000 abstracts per year, having an average length of 200 words each. Following his report, the Council voted 200 pounds sterling to carry out the work of the Commission.

Dr. J.H.M. Winters, Secretary-General of the FIP, was appointed Editor of the *Journal Mondiale de Pharmacie,* succeeding Dr. Paul Degand who recently resigned this post.

Plans for future FIP Congresses were approved as follows: FIP General Assembly, 28 August - 2 September 1960, in Copenhagen, International Congress of Pharmaceutical Sciences, 4-8 September 1961, in Pisa, Italy; meeting of FIP Council and Bureau, 11-15 September 1961, in Athens, Greece; FIP General Assembly, September 1962, Vienna, Austria.

Sir Hugh Linstead's Comments

During the meeting President Linstead spoke of some of the problems of FIP and of pharmacy in general, and requested future discussion by the Council on some of the challenges facing the profession. Sir Hugh's statement is as follows:

"If I had to give a title to this message to you, it would be simply 'Thoughts Passing Through the President's Mind.'

"The President of FIP sits before an international television screen on which appear reflections of pharmacy in different countries. He sees many differences in the manner in which pharmacy is practised: compare France, Poland, India . . . He sees many problems that are the same everywhere: the gulf between the university and the practice of pharmacy, the growth of

the factory-made medicine, the pressure exercised by national, international and other authorities upon the liberal professions of which pharmacy is one . . .

"These confused pictures resolve themselves into a few clear principles which can be labelled the Independence of pharmacy, the Indivisibility of pharmacy, the Integrity of pharmacy.

"Pharmacy has its own field of knowledge and its own standards of conduct and practice. Decisions upon pharmaceutical problems can be properly taken only by pharmacists. That is the essence of the *Independence* of pharmacy. Pharmacy is *Indivisible* in the sense that the science, the industry and the profession are complementary. The training of students and academic research have no meaning if they are divorced from practice. Equally, if pharmacy ceases to be scientific it loses the reason for its existence. Nor, in this century of internationalism and the W.H.O. can pharmacy in any country insulate itself from pharmacy elsewhere. Finally, pharmacy must have *Integrity* in the sense that it must accept complete responsibility for the medicaments it prepares and supplies.

"Our Independence is threated by the poser of the State, our Indivisibility by centrifugal forces that create self-contained groups (manufacturers, teachers, retailers . . .), our Integrity by the power of commercial forces in some countries.

"The President asks himself whether FIP is fully organised to be of service against these dangers? If it is, is the fullest use being made of the organisation? It is with these questions in his mind that he turns to his colleagues of the Bureau and the Council for advice, remembering that each of them is influential in shaping pharmaceutical policy in his own country. He invites them in Madrid to discuss with him, in the light of these remarks, some practical questions, not with the object of necessarily reaching precise and final conclusions but in the expectation that out of a general debate broad lines of general policy can emerge.

"1. Asia, Africa, America, Australia. Does FIP wish to become in fact what it is in name, the world organisation of pharmacy? If yes, what more must it do to bridge the Atlantic, the Pacific, the Mediterranean . . ? Can FIP have a regional organisation? Can it attract more Ordinary Members by reducing the subscription payable by distant societies? Africa is the nearest continent to Europe: can the Council meet in Africa?

"2. The Two Faces of Pharmacy. In some countries represented in FIP pharmacy is practised in privately owned pharmacies. In others it is an activity of the public authorities. Does FIP concentrate too much on the problems of the first group? If so, what can it do to meet better the needs of our colleagues who serve under the alternative system? Can we usefully extend our membership further to the east (U.S.S.R. . . .)?

"3. Professors and Professionals. The two words are close to one another. Sometimes the two groups are not. Can FIP bring them closer? Are there subjects of

Meeting of FIP Commission on Pharmaceutical Abstracts. Left to right are Prof. K. Steiger (Switzerland); Dr. Don E. Francke (U.S.A.); Miss Winfred Sewell (U.S.A.); Prof. U. Gallo (Italy); Mr. W. K. Fitch (Great Britain); Dr. M. Regnotto (Switzerland); Dr. J. Winters (Holland); and Mr. W. Eberhardt (Germany)

common interest, such as the education of the student of pharmacy, which could be discussed between them? Can the universities do more to help the practising pharmacist to keep his knowledge up to date? Are the universities in closer contact with the practising pharmacist in some countries that in others? If so, what is the reason? Are the results beneficial?

"4. The Constitution of FIP. Does our constitution enable us to do our work efficiently? Should we organise all our important discussions in the General Assembly? Or should we encourage the Sections to hold these debates in their own open sessions? Do we want to create more Sections (historians, cultivators of herbs . . .)? Or is there danger to the principle of 'indivisibility' if we do? Should we provide for the needs of the administrators and jurists within FIP? If so, how? How should we resolve differences of opinion among Sections?"

Entertainment and hospitality provided by the Consejo General de Colegios Oficiales de Farmaceuticos included a reception held in the halls of the Spanish pharmaceutical society, a reception and dinner-dance at the Palace Hotel, an excursion to Toledo including a visit to El Greco's home, a visit to the palaces, monasteries and monuments of El Escorial, and a country fiesta featured by Andalusian dancing.

1960 F I P GENERAL ASSEMBLY

► ANNOUNCEMENT OF TENTATIVE PLANS for the eighteenth General Assembly of the International Pharmaceutical Federation and the twentieth International Congress of Pharmaceutical Sciences have been made. Meetings will be held in Copenhagen, Denmark, August 29 through September 2 and the tentative program is as follows:

Program

Saturday, August 27

Premises: Danmarks farmaceutiske Hoejskole (The Royal Danish School of Pharmacy), Universitetsparken 2.
10.00-18.00: The Secretariat opens Reception of members.
10.00: Meeting of the Bureau
14.00: Meeting of the Bureau
Day available for meetings of Committees of the Sections.
Evening: Danmarks Apotekerforening has invited members of the Bureau and of the Organizing Committee to an informal dinner.

Sunday, August 28

Premises: Danmarks farmaceutiske Hoejskole (The Royal Danish School of Pharmacy), Universitetsparken 2.
10.00-18.00: The Secretariat open.
10.00: Meeting of the Council.
14.00: Meeting of the Council.
20.00: Reception by Danish Pharmaceutical Organizations.

Monday, August 29

Premises: The Tivoli Concert Hall.
10.00-12.00: Opening of the XVIIIth General Assembly of F.I.P. and of the XXth International Congress of Pharmaceutical Sciences.
Music A: Arrival of Government officials.
Music B: Address of Welcome by Mr. Sv.E. Bjoern, Chairman of the Organizing Committee. Opening Address by Sir Hugh Linstead, President of F.I.P.
Music C: Short lecture by Professor Niels Bohr (tentative). Presentation of the Hoest-Madsen Medal.
Music D: Musical Programme by Tivoli's Symphony Orchestra, Conductor: Sv.Chr. Felumb.
Participants are asked to arrive between 9.00 and 9.45 a.m. at which latter hour the doors will be closed.
Premises: The Tivoli Concert Hall.
14.00-17.00: Opening Meeting of the XXth International Congress of Pharmaceutical Sciences.
Opening address by Professor R. Ruyssen, President of the Scientific Section.
Papers by e.g. 1. Prof. H. Theorell. 2. Prof. I. R. Christiansen. 3. Other papers to be arranged.
19.00: Reception at The Copenhagen Town-Hall.

Tuesday, August 30

Premises:
9.00: Opening of the Exhibition of Apparatus and Medicaments.
Premises: D.f.H., Aud. 3.
9.30: Meetings of The Commission of Retail Pharmacists.
Premises: D.f.H., Aud. 2.
9.30: The Section of Industrial Pharmacists.
Premises: D.f.H. Botanical Dept.
9:30 The Section of Military Pharmacists.
Premises: D.f.H., Aud.1.
9.30: The Section of Hospital Pharmacists.
Premises: Anatomical Institute, Small Aud. 1.
9.30: The Press and Documentation Section.
Premises: The Royal Dental College, Aud. 2.
9.30: The Secretaries of Pharmacopeia Commissions.
Premises: The Royal Dental College, Aud. 1.
9.30: The Directors of Control Laboratories.
Premises: D.f.H., Pharmacog. Dept.
9.30: The Section of Pharmacognosists.
Premises: Medical-historical Museum.
9.30: L'Union Mondiale des Societes d'Histoire de la Pharmacie.
11.30 Ceremony in The Memorial Grove.
14.00 Meetings of Sections and Commissions. Reception by Danish Pharmaceutical Organizations.

Wednesday, August 31

Visit to Sweden.
8:30: Departure.
Premises: Malmo.
10.00-12.30: Meeting of General Assembly. Lunch.
14:30-17.00: Meeting of Congress of Pharmaceutical Sciences. Dinner.
21.00: (approx.) Arrival Copenhagen.

Thursday, September 1

Premises: Tivoli Concert Hall.
9.30: Open meeting of Retail Pharmacy Commission.
14.00: Meeting of Congress of Pharmaceutical Sciences. Meetings of Sections and Commissions.
16.00: Meeting of Council.
20.00-22.00: The Royal Theatre.

Friday, September 2

Premises: Tivoli Concert Hall.
10.00-12.00: General Assembly.
14.00-16.00: General Assembly of the F.I.P. Reports, Motions and Resolutions. Closing of the General Assembly and of the Congress of Pharmaceutical Sciences.
Premises: Hotel "Tre Falke."
19.00: Banquet.

Therapeutic Trends

edited by WILLIAM JOHNSON

Clinical Experience With An Asphaltite From The Dead Sea

Two hundred and ninety-eight patients were used in a study conducted by Dostrovsky *et al.* The object of the study was to determine the clinical value of an asphaltite refined from material collected from the Dead Sea. The preparations used were a 30 percent concentration in zinc paste and a 15 percent concentration in cream. Both preparations were effective. The zinc paste preparation seemed to be the best and it was well tolerated. The product is known as Bitupal and will be supplied by Aveeno Corporation. Bitupal was found to be especially effective in resistant dermatoses or nummular eczema, and seborrheic dermatitis. The results in neurodermatitis were good in general and excellent in infantile type. In pemphigus vulgaris with denuded areas or slowly healing erosions following the blisters, application of the paste was often followed by quicker epithelization than could be achieved by any other local therapy. It is a valuable adjuvant to the hormone therapy in this disease. The product, Bitupal, contains dialkylnaphthalene and benzothiophene. The results of the study were reported in *Antibiot. Med. Clin. Therap. 6*:518 (Sept.) 1959.

RICHARD H. HARRISON

Analgesic Effectiveness Of Phenyramidol Hydrochloride

The need for a moderately potent analgesic is still a major problem. The criteria of such medications are as follows: producing satisfactory analgesia in a majority of patients; producing analgesia without development of cumulative toxicity; and well tolerated and acceptable by the patient in oral form. A new drug, phenyramidol hydrochloride, was tested to ascertain its effectiveness in this criteria. The drug was supplied by the Irwin Neisler and Company. The study was divided into three parts. The first part consisted of 118 ambulant patients tested for the effectiveness for the relief of musculoskeletal disorders; the second part was also ambulatory patients with diseases other than musculoskeletal to determine any specificity of action; and the third group included hospitalized patients with medical and surgical conditions. Relief of pain was achieved in all three groups. The relief of pain was achieved regardless of etiology and without evidence of cumulative toxicity. Batterman *et al* noted no adverse effect upon the cardiovascular, gastrointestinal, or central nervous systems. The report of the study appeared in *Am. J. Med. Sci. 238*:315 (Sept.) 1959. Batterman *et al* found phenyramidol to be a moderately potent effective and safe analgesic for acute and chronic pain for both ambulatory and hospitalized patients.

RICHARD HARRISON

Orabase

The potential usefulness of a new vehicle, Orabase, for topical oral medications and mechanical protection in the oral cavity is described by A. Kutacher *el al* in *Oral Surg., Oral Med., Oral Path. 12*:1080 (Sept.) 1959. The components of this vehicle are Plastibase, carboxymethylcellulose, pectin, and gelatin. This vehicle has the ability to adhere and maintain itself at the site of application over relatively prolonged periods, thereby, 1. increasing the potential effectiveness of medications by maintaining higher concentrations of the agent at the site of a given lesion; 2. decreasing the total amount of material which need be applied; 3. increasing the duration over which the material will remain *in situ*; 4. decreasing the amount of material which, following displacement from the area, would be swallowed and might therefore be available for undesired systemic activity; and 5. providing a useful mechanical protective coating over the lesion. Various clinical tests were undertaken on a total of 119 patients (784 applications). The minimum period of maintenance was observed on the dorsum of the tongue in which area an average duration of 15 minutes was observed following the application of 125 mg. Orabase. The maximum period of maintenance was observed in the mucobuccal fold in which area an average duration of 152 minutes was observed following the application of approximately 250 mg. vehicle. No evidences of irritation, side reaction, or toxicity were observed, either locally or systemically, following single or repeated applications of the adhesive vehicle. Orabase was supplied by E. R. Squibb and Sons.

SYLVIA SCHMIDT

Timely Drugs

Decominic

COMPOSITION: Chlorpheniramine maleate, pyrilamine maleate, phenylephrine hydrochloride, and ascorbic acid.
INDICATIONS: Symptomatic control of nasal allergies and seasonal hay fever plus stress vitamin.
SIDE EFFECTS AND CONTRAINDICATIONS: Should be used with caution in hyperthyroid or hypertensive patients.
DOSAGE: Adults, one tablet every 8 to 12 hours.
PREPARATIONS: "Gradual and continuous release" tablets containing chlorpheniramine maleate 6 mg., pyrilamine maleate 37.5 mg., phenylephrine hydrochloride 15 mg., and ascorbic acid 75 mg.
PACKAGING: Bottles of 50 and 250 tablets.
SUPPLIER: Flint, Eaton & Co.

Marplan

GENERIC AND CHEMICAL NAMES: Isocarboxazid; 1-benzyl-2-(5-methyl-3-isoxazolylcarbonyl)hydrazine.
INDICATIONS: Prophylaxis of pain in angina pectoris; in a variety of psychiatric disorders with associated symptoms of depression, withdrawal or regression; as adjunctive therapy in rheumatoid arthritis.
SIDE EFFECTS AND CONTRAINDICATIONS: Should be used cautiously in overactive, overstimulated or agitated patients; in rare instances, hallucinations with high dosages; should not be used in epileptic patients.
DOSAGE: Usually, 30 mg. daily in single or divided dosage; maintenance, 10 to 20 mg. daily.
PREPARATIONS: Tablets, 10 mg.
PACKAGING: Bottles of 100 and 1,000 tablets.
SUPPLIER: Roche Laboratories.

Ostensin

GENERIC NAME: Trimethidinium methosulfate, an asymmetrical methonium compound.
INDICATIONS: For management of diastolic hypertension.
SIDE EFFECTS AND CONTRAINDICATIONS: Blurring of vision, postural hypotension, constipation—usually controlled by reducing dosage; contraindicated in presence of organic pyloric stenosis, marked cerebral arteriosclerosis, bleeding peptic ulcer, recent coronary thrombosis or cerebral thrombosis; should be administered with caution to patients with severe renal disease.
DOSAGE: Initially, 20 mg. before breakfast, in mid-afternoon, and before retiring; increased in increments of 20 mg. per dose every third day; most patients require 120 to 140 mg. daily divided into three doses administered in a fasting or near-fasting state.
PREPARATIONS: Tablets of 20 mg. and 40 mg.
PACKAGING: Bottles of 100 tablets.
SUPPLIER: Wyeth and Co.

Otrivin

GENERIC NAME: Xylometazoline hydrochloride.
INDICATIONS: Topical vasoconstrictor especially for cold and hay fever patients sensitive to the burning sensation or stinging often associated with drugs of this type; indicated in symptomatic relief of nasal congestion.
SIDE EFFECTS AND CONTRAINDICATIONS: Slight burning and stinging, rebound congestion, sneezing, dry nose, and insomnia.
DOSAGE: Nasal solution—2 or 3 drops in each nostril every 3 to 4 hours; nasal spray—squeeze once or twice into each nostril (pediatric spray—once into each nostril), repeating every 4 hours.
PREPARATIONS: Nasal solution and spray, 0.1 percent; pediatric nasal spray, 0.05 percent.
PACKAGING: Nasal solution, bottles of 1 ounce; nasal spray, plastic squeeze tubes of 15 ml.; pediatric nasal spray, plastic squeeze tubes of 15 ml.
SUPPLIER: Ciba Pharmaceutical Products, Inc.

Povan

GENERIC NAME: Pyrvinium pamoate.
INDICATIONS: Pinworm infections.
SIDE EFFECTS AND CONTRAINDICATIONS: Occasionally, nausea or vomiting.
DOSAGE: Adults and children, a single dose equivalent to 5 mg. anhydrous pyrvinium base per Kg. of body weight, or approximately one 5 ml. teaspoonful per 22 pounds body weight. Suspension will stain if spilled.
PREPARATIONS: Strawberry-flavored suspension containing the equivalent of 10 mg. anhydrous pyrvinium base per ml.
PACKAGING: Bottles of 2 ounces.
SUPPLIER: Parke, Davis & Co.

Prolixin

GENERIC AND CHEMICAL NAMES: Fluphenazine dihydrochloride; 4-{3-[2-(trifluoromethyl)-10-phenothiazinyl]propyl}-1-piperazineëthanol dihydrochloride.
INDICATIONS: In treatment of various acute and chronic psychoses; in management of psychomotor hyperactivity and overt hostility frequently associated with schizophrenia, mania, etc.
SIDE EFFECTS AND CONTRAINDICATIONS: Should be used with caution in patients with a history of convulsive disorders; agranulocytosis and leukopenia have been observed with some phenothiazine derivatives; should not be used in patients on large doses of hypnotics.
DOSAGE: Individually adjusted. For psychotic patients, 2.5 to 10 mg. daily, gradually increased until desired clinical effect is obtained. Dosage over 20 mg. daily should be used with caution. For geriatric patients, initially 1 to 2.5 mg. daily. Dosages are given in two equal doses, at 12 hour intervals.
PREPARATIONS: Tablets, 1 mg., 2.5 mg. and 5 mg.
PACKAGING: Bottles of 50 and 500 tablets.
SUPPLIER: E. R. Squibb & Sons.

Notes + Suggestions

by MILTON W. SKOLAUT

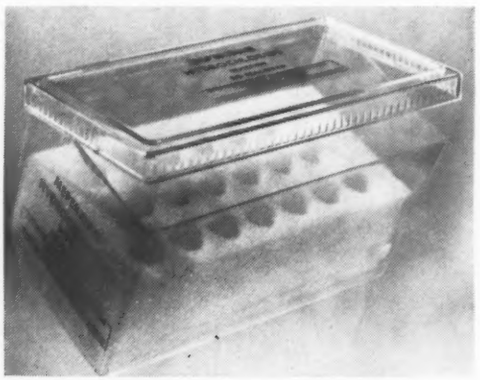
PRESCRIPTION HOLDER FOR LABEL TYPEWRITER

A clear see-through plastic container is attached to the side of a prescription typewriter at an easy reading height. The container is approximately the size of a prescription blank, allowing the pharmacist to read the prescription for label typing purposes at the most convenient spot. It further serves to keep the prescriptions in proper order of receipt.

CARRIER FOR LARGE PRESCRIPTIONS

A junior size shopping bag made of heavy white Kraft paper is convenient for quart size containers and for one pound ointment jars. Frequently, prescriptions for large amounts of drugs in multiple bottles are difficult to issue by wrapping or by placing in the customary brown Kraft paper bags. The carrying handles add to the convenience of the patient.

NARCOTIC AMPUL DISPENSING CONTAINER



A polystyrene plastic container with a urethan foam insert is used for the dispensing of individual narcotic ampuls to the nursing units. The box and lid may be labeled by the off-set printing process or paper self-adhering labels. The urethan foam insert prevents breakage while the see-thru plastic container allows for narcotic counts without individual ampul handling.

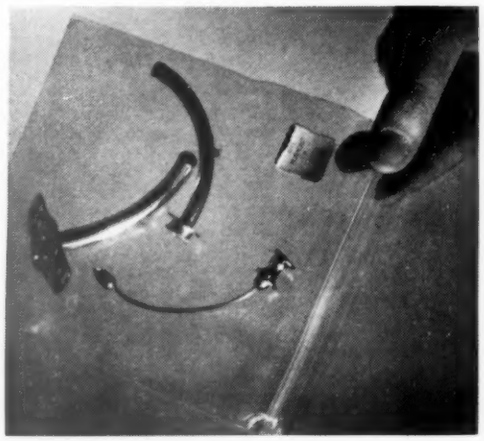
MEDICATION CONTAINERS

Glass medicine containers* with polyethylene plastic snap-on caps are convenient for inpatient and outpatient drug dispensing. They are considered safer for outpatient dispensing since the polyethylene snap-on cap is difficult to remove by small children, but is easily removed by adults. For inpatient dispensing, the

*T. C. Wheaton Company
Millville, New Jersey

containers are sealed with an aluminum seal. This provides a truly tamper proof container for prepackaged storage in the pharmacy and on the nursing units until the seal is broken. Control numbers are shown on the reverse side of the container.

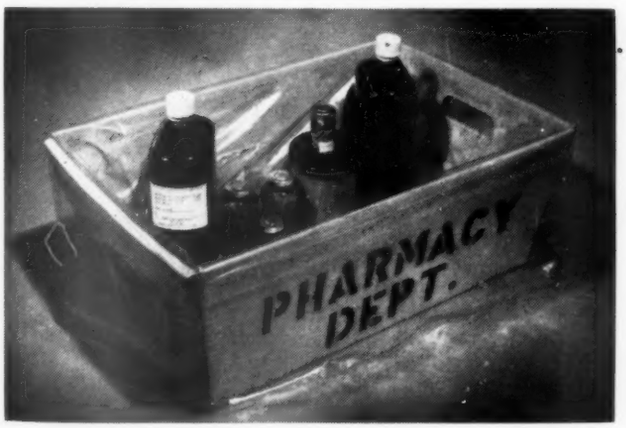
ZIPPER CLOSING PLASTIC BAG



Considerable loss of materials occurs in hospitals in the storage of multiple part items such as trachea and laryngectomy tubes, cournand needles, and small repair parts. The use of various sizes of re-sealable polyethylene bags* allows safer storage of the various parts by greatly reducing losses and also reducing processing time due to tarnishing of sterling silver items. A large range of sizes is available for a variety of uses.

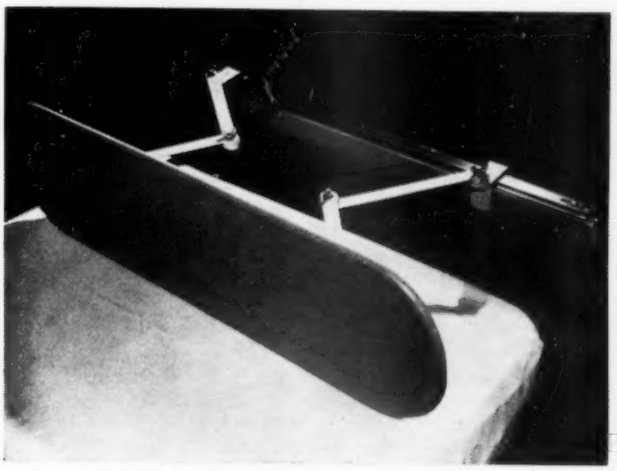
*Kennedy Car Lines and Bag Company
3000 Prospect Avenue
Shelbyville, Indiana

NURSING UNIT DRUG CONTAINERS



A heavy fiberboard box with hand holes is shown with a polyethylene plastic liner inside of the box and extending over the outer edge. The polyethylene plastic bag is renewed prior to each issue, thereby reducing the possibility of cross infection from contaminated containers or materials being returned from the nursing units. Further, it eliminates washing and cleaning of aluminum or steel pharmacy baskets between issues. The replacement of new plastic bag prior to each use reduces the cost of labor.

ADJUSTABLE PATIENT FOOTBOARD



An adjustable footboard* is shown which can be produced in the carpentry and metal shops of the hospital. The overall measurements of the board are approximately 10″x36″. It is easily adjustable up to 20″ from the foot of the bed. This piece of equipment is economical to build, easy to attach, simple to adjust, and requires little storage space.

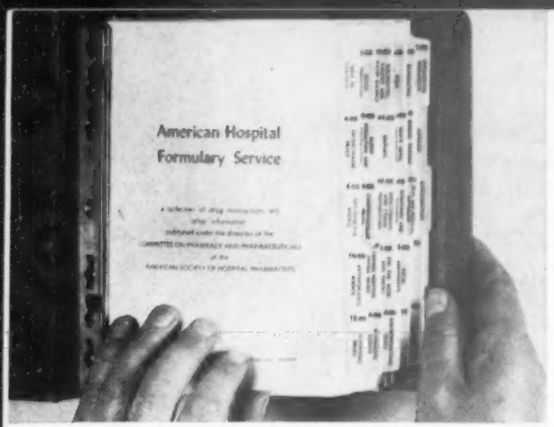
*Designed by Mr. Joseph N. Salvino
Constructed by Mr. Samuel L. Rickman

MANUAL ON BLOOD SERUMS

A "Manual of Blood Grouping and Rh Typing Serums" has been issued by Hyland Laboratories, Los Angeles 39, California. This manual includes a discussion of the principles involved and the procedures used in blood grouping and typing

FERROUS FUMARATE

A descriptive brochure on ferrous fumarate (Toleron®) has been released by Mallinckrodt Chemical works. Ferrous fumarate provides a readily available source of ferrous iron which can be used alone or as a constituent of various drug preparations for oral administration. Toleron is therapeutically equivalent to other ferrous compounds, such as ferrous sulfate and ferrous gluconate, and offers advantages with regard to tolerance, taste and unusual stability according to the manufacturer.



AMERICAN HOSPITAL FORMULARY SERVICE

edited by WILLIAM HELLER, *Chairman ASHP Committee on Pharmacy and Pharmaceuticals*

Third Supplement Available

► The Third Supplement, which was distributed in December, contained monographs on the following drugs:

cottonseed oil (including Lipomul I.V.) 40:20
fluoxymesterone (Halotestin, Ora-Testryl, Ultandren) (including Halodrin) 68:08
griseofulvin (Fulvicin, Grifulvin) 8:12
hydrocortisone 84:06
imipramine hydrochloride (Tofranil) 28:16
levallorphan (Lorfan) tartrate 28:10
magnesium oxide 56:04
prednisolone (including Hydeltracin, Hydeltrasol, Meti-Derm, Neo-Delta-Cortef) 84:06
ristocetin (Spontin) 8:12
sulfadimethoxine (Madribon, Madriqid) 8:24
triamcinolone acetonide (Aristocort Acetonide, Kenalog) (including Mycolog) 84:06
urea (carbamide) (including Urevert) 40:20
vancomycin (Vancocin) 8:12

Fourth Supplement

► The Fourth Supplement, a 32-sheet supplement to be issued in February, will probably contain monographs on the following drugs (some may be deleted or others added):

benoxinate (Dorsacaine) hydrochloride 52:16
benztropine (Cogentin) methanesulfonate 12:08
betazole hydrochloride (Histalog) 36:36
bisacodyl (Dulcolax) 56:12
brompheniramine maleate *and* dexbrompheniramine maleate 4:00
butabarbital (Butisol) sodium 28:24
calcium pantothenate *and* dextro pantothenyl alcohol (including Cozyme, Ilopan, Panthoject) 88:08
carbarsone 8:04 *and* 8:32
chlorpheniramine maleate *and* dexchlorpheniramine maleate (Chlor-Trimeton Maleate, Novahistine preparations, Polaramine, Teldrin) 4:00 (to replace present monograph on chlorpheniramine maleate)
coconut oil (including Ediol) 40:20
corn oil (including Lipomul Oral) 40:20
(the two above to replace present monograph on Fat Emulsion, Oral)
cyclizine (Marezine) hydrochloride (including Maredox) 56:20
dextro pantothenyl alcohol (including Aquasol A Cream, Pantho-derm, Pantho-F, Tashan Cream) 84:16
fibrinolysin (human) (Actase, plasmin) 44:00
isoxsuprine hydrochloride (Vasodilan) 24:12
penicillinase (Neutrapen) 44:00
phenformin (DBI) 68:20
pheniramine (Trimeton) maleate (including Novahistine, Trimetose) 4:00
plasma protein fraction (human) (Plasmanate) 16:00
titanium dioxide 84:24.12
zoxazolamine (Flexin) (including Flexilon) 12:20

Other monographs in preparation include:

general statement on The Phenothiazines 28:16
isocarboxazid (Marplan)
methoxypromazine (Tentone)
nialamide (Niamid)
phenelzine (Nardil)
β-phenylisopropyl hydrazine (Catron)
pipamazine (Mornidine)
thioridazine (Mellaril)
trifluoperazine (Stelazine)

Among other monographs in preparation are the following:

amphotericin B (Fungizone) 8:12
benzonatate (Tessalon) 48:00
carbinoxamine (Clistin) maleate 4:00
cetylpyridinium (Ceepryn) chloride (including Cepacol) 52:28
chlorzoxazone (Paraflex) (including Parafon) 12:20
chymotrypsin (Chymar, Enzeon) 44:00
chymotrypsin *and alpha*-chymotrypsin (Chymar, *alpha*-Chymar, Zolyse) 52:36
clove oil *and* eugenol 32:00 (new category)
demethylchlortetracycline (Declomycin) 8:12
dienestrol (Restrol, Synestrol) 68:16
diethylcarbamazine (Hetrazan) citrate 8:08
dihydroxyaluminum aminoacetate (Alminate, Alzinox, Robalate) 56:04
diphenylpyraline (Diafen, Hispril) hydrochloride 4:00
flumethiazide *and* hydroflumethiazide (Ademol, Saluron) (including Rautrax) 40:28
furaltadone (Altafur) 8:40
furazolidone (Furoxone) 8:40
glyceryl guaiacolate (Robitussin) 48:00
hexadimethrine bromide (Polybrene) 20:12.08
hexocyclium methylsulfate (Tral) 12:08
hydrocortisone 52:08
hydroxychloroquine (Plaquenil) sulfate 8:20
merbromin (Mercurochrome) 84:04.16
mercocresols (Mercresin) 84:04.16
mercury bichloride *and* mercury oxycyanide 84:04.16
methotrexate 10:00
methoxamine (Vasoxyl) hydrochloride 12:12
methylergonovine (Methergine) maleate 76:00
methylthiouracil (Muracil) 68:36
nitromersol (Metaphen) 84:04.16
nylidrin (Arlidin) hydrochloride 12:12
oxyphenisatin (Lavema) 56:12
phenylazodiaminopyridine hydrochloride (Mallophene, Pyridium) 8:36
phenylpropanolamine (Propadrine) hydrochloride 12:12
procyclidine (Kemadrin) hydrochloride 12:08
pyridostigmine (Mestinon) bromide 12:04
pyrimethamine (Daraprim) 8:20
sodium 2-ethylhexyl sulfate (including Tergemist) 48:00
sodium fluoride 32:00
sodium glucosulfone (Promin) 8:26 (new category)
sodium radio-chromate (Cr^{51}) 78:00
sodium sulfoxone (Diasone Sodium) 8:26
syrosingopine (Singoserp) 24:08
tetrahydrozoline (Tyzine) hydrochloride 52:32
thiazolsulfone (Promizole) 8:26
thimerosal (Merthiolate) 84:04.16
trimethobenzamide hydrochloride (Tigan) 56:20
trypsin (Parenzyme, Tryptar) 44:00

News

Trygstad Receives Andrew Craigie Award

ASHP PRESIDENT VERNON O. TRYGSTAD was the recipient of the first Andrew Craigie Award "for outstanding accomplishment in the advancement of professional pharmacy in the Federal Government." The award, established in 1959 by the Lederle Laboratories, Division American Cyanamid Company, honors the memory of Andrew Craigie, first Apothecary General of the military forces serving under General George Washington during the Revolutionary War.

A silver plaque commemorating the award, was presented to Mr. Trygstad during the Honors Night Dinner of the Association of Military Surgeons meeting in Washington, D. C. on November 11. Mr. Trygstad is recognized for his outstanding work as Director of Pharmacy Service in the Department of Medicine and Surgery of the Veterans Administration, as well as his work in the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

► The Executive Committee of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS will meet in Washington, D. C. on February 4 and 5. Affiliated chapters and members of the SOCIETY wishing to have matters called to the attention of the Committee should write to either President Vernon O. Trygstad or Secretary Gloria Francke.

► ROBERT BOGASH, Director of the Pharmacy Department of Lenox Hill Hospital in New York City, recently spoke to the senior students at the St. John's University College of Pharmacy in Jamaica, on the general area of hospital pharmacy. Mr. Bogash's talk centered on the place of the pharmacy department in the structure of the hospital organization. In addition, he spoke of the scope and function of the hospital pharmacy.

The talk is one of a series being sponsored at the University throughout the school year, according to Dr. Andrew J. Bartilucci, Dean of the College of Pharmacy.

► RESEARCH . . . VALUE . . . INTEGRITY . . . as related to community health, is the subject of a reprint explaining facts about drug costs. Available without charge from the American Pharmaceutical Association, the booklet provides pharmacists with valuable information at a time when great interest in the cost of drugs is being exhibited by the public.

► CLINICAL PHARMACOLOGY AND THERAPEUTICS is the title of a new Journal beginning publication in January, 1960. It is available from The C. V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Mo.

► MR. GEORGE BUGBEE, President of the Health Information Foundation, New York City, has been appointed a member of the Federal Hospital Council which serves in an advisory capacity to the Surgeon General on the administration of the Hill-Burton program. Mr. Bugbee has had wide experience in the hospital field and was formerly Executive Director of the American Hospital Association.

► MR. C. J. KELLER, formerly at Hackensack Hospital in Hackensack, N. J., has accepted a position in the Pharmacy Department at St. Mary's Hospital, St. Louis. Mr. Keller completed the residency program in hospital pharmacy at Jefferson Medical College Hospital, Philadelphia, with graduate work at the Philadelphia College of Pharmacy and Science.

► THE AMERICAN COLLEGE OF APOTHECARIES will hold its Annual Convention at the Americana Hotel in Miami Beach, Florida on February 14-17. U.S. Food and Drug Commissioner George P. Larrick, will be one of the key speakers. His subject will be "The Food and Drug Administration's Responsibilities and Obligations in Drug Distribution."

► DR. LINWOOD F. TICE has recently been named Dean of the Philadelphia College of Pharmacy and Science, Philadelphia. He replaces Dr. Ivor Griffith who has relinquished the post after 22 years, so that he might devote his full time and capacities to the office of President of the College.

Life Data On Famous Pharmacists Asked by A.I.H.P.

What have pharmacists of the past and present generation done that contributes in an unusual or outstanding way to society or to the profession of pharmacy? A new four-page questionnaire now going out from the office of the American Institute of the History of Pharmacy is designed to make sure this information is not lost or ignored.

The instruction and biographical queries appear in both French and English to help assure precise understanding and information, whether the recipient is a pharmacist in Sweden, Kansas, Yugoslavia, or Japan. Funneling into the Institute's classified collection will be biographical data, photographs, publications, and personal records concerning "men of recent

history, in or from pharmacy, who have achieved much or dared much and thus add a memorable bit to a record that helps make pharmacists proud of their profession."

Thus the Director of the Institute, Dr. Glenn Sonnedecker, characterizes the aim of the project, pointing out that it will be an ongoing effort in the years ahead. "To understand the significance of social and scientific contributions coming from the field of pharmacy requires more than a news report or data from a man's laboratory or his granddaughter's hazy recollections," he pointed out. "The present effort represents only a small new facet of an old effort. It is an attempt to make sure that we today, and tomorrow's historians, have firm evidence to make clear pharmacy's many-sided role in history, internationally."

Dr. Sonnedecker indicated that requests for biographical material would go out to that man, licensed as a pharmacist in any country, whose work seemed to hold promise of being historically memorable. Somewhat more comprehensive records on American contributions are attempted; and anyone interested in aiding the project may obtain copies of the leaflet containing instructions and biographical queries by addressing the American Institute of the History of Pharmacy at Madison 6, Wisconsin.

Lederle Grant for Research

The third annual $10,000 research grant for research and development in hospital pharmacy has been awarded to the American Pharmaceutical Association Foundation by Lederle Laboratories Division, America Cyanamid Company.

In announcing the award today, Dr. William S. Apple, Secretary of the Foundation, stated, "We are extremely grateful to Lederle for making these research funds available. The money will enable our people throughout the country to initiate research projects which otherwise might not be undertaken. It is gratifying that a member of the pharmaceutical industry provides this kind of support to basic research projects."

Lederle's E. M. Blake (l) presents a $10,000 check for research and development in hospital pharmacy to Paul F. Parker (r) of the ASHP Committee on Research and Development

Dr. Apple explained that the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, an affiliate of the American Pharmaceutical Association, has designated the A.Ph.A. Foundation to administer the grant. The ASHP will select those research projects and investigators to be supported with funds from the grant.

The grant was accepted by Mr. Paul F. Parker, Secretary of the Committee on Research and Development of the ASHP.

According to Mr. E. M. Blake of Lederle who made the presentation, these annual research grants were established by Lederle in 1956 to support research activities within the defined scope of hospital pharmacy, hospital pharmacy administration, services, education or general welfare.

Applications for grants for research in hospital pharmacy may be directed to Mr. Paul Parker, Director, Division of Hospital Pharmacy, American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington 7, D. C.

New York State Council of the ASHP

The Council of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS in New York State met at Albany Hospital, Albany, New York, on October 20, 1959. Fifteen members were present representing the five ASHP Affiliated Chapters in New York.

Mr. Robert C. Bogash presented a draft of twenty-one definitions which the New York State Board of Pharmacy requested as a basis for future discussions. Using the comments and suggestions presented by the Council members as a guide, Mr. Bogash will rewrite the definitions and send them to the Chapters for approval.

Sister Mary Etheldreda reviewed the meeting which she attended with State Board of Pharmacy Secretary, Kenneth Griswold and State Education Commissioner, Robert C. Killough. Sister was informed that there was no opening on the State Board of Pharmacy this year. She also was told of the geographical stipulation which required the individual receiving the appointment being from the same area of the state as the individual he is replacing.

Mr. Norman Baker presented a Constitution and By-laws which the Council discussed. It was amended where necessary and will also be submitted to the Chapters for approval.

Mr. William Whitcomb discussed the contract which Rochester General Hospital has made with a retailer, whereby all pharmacy service in the hospital is being maintained by the retailer.

as the president sees it—

VERNON O. TRYGSTAD, *Veterans Administration, Washington, D. C.*

► FALL AND EARLY WINTER seems to be the season for many hospital pharmacy seminars and hospital association meetings in which hospital pharmacists are taking an active part. I do not know if this is a growing trend. But it speaks well for hospital pharmacy that so many of its members are participating in these programs. Many are doing extra work and giving up valued leisure time to become "week-end students"—to keep abreast of new developments in pharmacy, and to share ideas with colleagues at seminars and professional meetings.

In many states with active hospital pharmacy organizations, distances are great and it takes more than just a little extra effort to take part. This is the spirit that the discerning employer looks for—the person "active in professional societies and organizations"—when he gives a promotion or fills a key position. This, he knows, is the individual who will keep growing.

I have been privileged to participate in several of the fall meetings and seminars, all with excellent, stimulating programs. Reports from others, which I could not attend personally, indicate the same degree of excellence and enthusiasm. Also, last month, many government pharmacists and others belonging to military reserve components attended meetings of the Association of Military Surgeons in Washington. I was especially pleased that Norman Hammelman, our Chairman of the Committee on Pharmacists in Government Service, was on an assignment in Washington and could attend the meetings and contact some of his committee members.

It has been extremely gratifying to note the acceptance in so many hospitals of the American Hospital Formulary Service. It is appreciated most, perhaps, by those who have at one time or another gone through the process of developing a formulary of their own, or attempted to do so. When one compares the cost of a number of copies—twenty or thirty, say, for the average hospital—with the cost of the many man hours required to develop a complete formulary individually, it becomes apparent what a really sound investment the Formulary Service is. Add to the practical saving in time, which to most of us is money, the fact that in the Formulary, accuracy and unbiased evaluation of the drugs described are assured. This is made possible by the painstaking efforts of experts in their fields—pharmacists, physicians, pharmacologists—whom Dr. Heller has managed to interest in collaborating with him.

Formulary Service on S. S. Hope

I know ASHP members will be pleased that the American Hospital Formulary Service is to be an important part of the reference library of the Project HOPE hospital ship sponsored by the People to People Health Foundation. The S. S. HOPE will bring the benefits of American medical knowledge to many parts of the world on the invitation of the medical professions of the countries to be visited. The American Hospital Formulary Service should be of inestimable value to the professional staff of this unique and noteworthy project.

It will be interesting to see who the pharmacist will be who is selected to serve on the S. S. HOPE. He should be a hospital pharmacist. Surely it will be someone with a profound interest in people all over the world, a love for his profession, a spirit of adventure, a yen for work—and someone looking to the future with the full realization of the value of the experience to be gained on this mission. The American pharmaceutical industry will be furnishing many of the drugs. Wouldn't it be an inspiring gesture if all of organized pharmacy would get together and sponsor the pharmacist for Project Hope by underwriting his salary?

Best wishes to all for a happy holiday season.

Vernon Trygstad

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

. . . . . .

edited by CLIFTON J. LATIOLAIS, HENRY J. DEREWICZ *and* LEO F. GODLEY

SELECTING WATER-SOLUBLE GUMS

Selecting Water-Soluble Gums, Ferri, C. M., Drug and Cosmetic Industry 85:44 (July) 1959.

An important responsibility of the suppliers to the users of gums is the elimination of gum property changes such as viscosity, color, insolubles and moisture content caused by seasonal variations through well organized purchasing methods. The suppliers can also furnish gums at a stable price at any time of the year. Variations in the color of gum arabic and karaya are caused by differences in the time of gum gathering. The color of grains or powders of equal mesh size indicates their purity, the lighter colors being cleaner. Variations in the color of guar, locust bean and tragacanth indicate changing viscosities and are the result of the type of seed collected or exudation gathered. Generally, the very fine mesh sizes of gums should be avoided for they usually yield the darker solutions, with some viscosity characteristics of the gum itself being destroyed. While the whole gums are less expensive to purchase, the processed gums offer the advantages of much greater control of end product, impurities and processing time. Utilizing a gum of uniform viscosity is of the utmost importance to the manufacturer who has finally adjusted his formulation to a particular grade of gum. Gum purity is usually indicated by a low percentage of insolubles and light color. Whereas the U.S.P. and N.F. establish minimum standards to protect the user, reliable suppliers will make every effort to furnish gums at standards well above the minimum for products such as foods and pharmaceuticals. Most dusting problems with gums can be minimized by proper selection of mesh sizes of the gums—coarser powders producing very little dust. Since most gums, either natural or synthetic, support mold or bacterial growth, users must provide preservatives for their products. A 0.1 percent content of benzoate of soda, phenol, or commercially available phenol derivative, based on the total weight of the finished product, is usually successful. Some of the equipment now used for standardization of gums includes reflectometers, spectrophotometers, pH control equipment and modern viscosity meters. The suppliers equipped with broad technological knowledge and up-to-date equipment have been leading the way in custom made gums.

EDWARD OSBORNE

PHENOBARBITAL IN PAPER CHROMATOGRAPHY

Separation of Decomposed Products of Phenobarbital Sodium by Paper Chromatographic Technique, Kapadia, A. J., Goyan, J.E. and Autian, J., J. Am. Pharm. Assoc., Sci. Ed. 48:407 (July) 1959. (College of Pharmacy, University of Michigan, Ann Arbor, Mich.)

The feasibility of using chromatographic procedures to effect a separation of the decomposed products of the barbiturates was investigated. Phenobarbital was used since the decomposition products of it in alkaline solution are commonly known. An ascending paper cromatographic technique was employed for separation. Two types of solvent systems were used, a one phase and a two phase system. Of the variety of solvent combinations used, the best results were obtained with a two phase system using *n*-amyl alcohol saturated with borate buffer (pH 10). To identify the barbiturate and its products, they were sprayed with staining solutions. This technique could not be used when buffers were employed, instead ultraviolet light was utilized for visualizing the compounds. Other barbiturate solutions are being investigated by these same methods for separation and identification of the decomposed products.

H. A. K. WHITNEY, JR.

DEGRADATION OF CHLOROBUTANOL

The Kinetics of Degradation of Chlorobutanol, Nair, A. D. and Lach, J. L., J. Am. Pharm. Assoc., Sci. Ed. 48:390 (July) 1959. (State University of Iowa, College of Pharmacy, Iowa City, Iowa.)

Stability studies of chlorobutanol in aqueous solutions, previously investigated by other authors, are outlined. Since no work on the quantitative decomposition of chlorobutanol in aqueous solutions has been reported in the literature, it was the intent of the authors to study the kinetics of degradation of chlorobutanol. The results obtained indicate that the degradation is base catalyzed. The rate equation was postulated. The energy of activation and half-life periods were calculated. The degradation is first order with respect to chlorobutanol. Products of the degradation were identified as acetone, carbon monoxide, chloride ion, and *alpha*-hydroxyisobutyric acid. Various reaction mechanisms suggested by authors were contemplated. The authors presented the mechanism which appeared correct in light of their study. It was noted that the loss of chlorobutanol from pharmaceuticals is not due to chemical decomposition alone, but also it is due to the volatilization during preparation and during storage through porous containers, closures, etc. In using chlorobutanol, it was found that the rate of degradation was small and constant at a pH below 4. However, when it is necessary to have a pH greater than 4, it is possible to calculate the amount to add in excess to compensate for the loss due to degradation.

H. A. K. WHITNEY, JR.

STABILITY OF VITAMIN B_{12}

A Note on the Stability of Vitamin B_{12} in the Presence of Thiochrome, Ravin, L. J., and Doerge, R. F., J. Am. Pharm. Assoc., Sci. Ed. 48:425 (July) 1959. (Research and Development Division of Smith Kline and French Laboratories, Philadelphia, Pa.)

A brief resume of recent studies on the chemical interactions of the water-soluble vitamins, and especially the stability of vitamin B_{12} in the presence of thiamine and nicotinamide is reported. It is noted that in these studies the role of thiochrome has not been considered. The authors point out the possibility of thiochrome, an oxidation product of thiamine, interacting with vitamin B_{12} in an aqueous buffered solution. The initial results proved thiochrome not to be responsible for accelerating the decomposition of vitamin B_{12}. Further investigations are being conducted to relate the interaction of vitamin B_{12} with thiamine and with its decomposition products.

H. A. K. WHITNEY, JR.

BACTERIOSTATIC AGENT FOR INJECTION

The Basis for Injections Containing Sufficient of a Suitable Bacteriostatic Agent, Sykes, G., J. Pharm. and Pharmacol. 10 Supplement: 40T (1958).

The author stated that the basic requirements for a suitable bacteriostatic agent for use in injections as envisioned by the *British Pharmacopoeia* might be summarized as: (1) the ability to prevent growth of, and preferably to kill, contaminating microorganisms; (2) compatibility with the medicament; (3) low absorption rate into rubber of the closure; and (4) absence of toxicity to the patient in the quantities employed. The factors particularly considered by the author were (1) and (3).

The antibacterial properties of the bacteriostatic agents recommended by the *B.P.*—phenol 0.5 percent, cresol 0.3 percent, chlorobutanol 0.5 percent, chlorocresol 0.1 percent, and phenylmercuric nitrate 0.001 percent—were studied as well as the properties of benzyl alcohol 2 percent, dichlorobenzyl alcohol 0.1 percent, cetrimide 0.01 percent, methyl paraben 0.2 percent, and propyl paraben 0.02 percent. These agents were tested against mixed strains of *Staphylococcus aureus, Escerichia coli, Pseudomonas pyocyanea,* and mold spores. The lethal power within 24 hours of phenol, cresol, chlorobutanol, chlorocresol, phenylmercuric nitrate, benzyl alcohol, dichlorobenzyl alcohol, cetrimide, and mixed parabens was fairly good against the bacteria but only chlorocresol, phenylmercuric nitrate, and cetrimide were effective against mold spores. A reduction of one-half in the concentration of cresol, chlorobutanol, chlorocresol, and benzyl alcohol, the only agents studied at a lower concentration, was found to practically eliminate the effectiveness of the agent against bacteria and mold spores. As was to be expected, there was considerable variation from one agent to another and from one organism to another. In general, S. aureus was more resistant than the two gram-negative organisms.

The loss of bacteriostatic agents by absorption into the rubber closures of multiple dose containers was discussed in relation to the tabulated partitioning ratios between rubber and water. The higher the distribution percent in rubber as compared with water, the greater will be the loss of the bacteriostatic agent into rubber. Benzyl alcohol and methyl paraben had the lowest distribution in rubber with phenol, cresol, and propyl paraben reasonably low.

The author stated that the bacteriostatic agents recommended by the *B.P.* are probably usable but they have definite limitations, factors which should be clearly recognized before they are considered entirely suitable in particular circumstances. He also stated that there is a need for new, more suitable bacteriostatic agents.

ABSTR. FROM AM. J. PHARM. *131:195* (MAY) 1959.

COATING OF DRUG PARTICLES

Air-Suspension Technique of Coating Drug Particles, Wurster, D. E., J. Am. Pharm. Assoc., Sci. Ed. 48:451 (Aug.) 1959. (School of Pharmacy, University of Wisconsin, Madison, Wis.)

A new air-suspension method for the rapid application of coating materials to small particles is described. The process consists of supporting particles in a vertical column with an upwardly moving air stream during which the coating solution is atomized onto the suspended particles. The velocity of the air stream is adjusted so that the suspended particles are maintained in a relatively confined working region of the column. The drying time of the coat can be governed by controlling either the atomization rate, the temperature of the supporting air stream or both. The described process does not appear to be limited by either the coating materials or the solvent system, as both polar and non-polar materials and solvents have been successfully employed in the coating fluid. Preliminary investigations indicate the process to be suitable for applying rounding coats for sugar-coated tablets, film type coats to compressed tablets, and profective coats on small particles to prevent chemical decomposition. The process also appears to be useful for applying coating materials for the purposes of controlling drug release, improving flow properties of small particles, preparing tablet granulations, and many other coating operations in pharmaceutical, food, animal feed and other industries.

HENRY J. DEREWICZ

MICRODETERMINATION OF TROPANE ALKALOIDS

Ion Exchange Separation Method for Microdetermination of Tropane Alkaloids in the Presence of Morphine, Sjostrom, E., and Randell, A., J. Am. Pharm. Assoc., Sci. Ed. 48:445 (Aug.) 1959. (Analytical Laboratory, Laaketehdas Orion Oy, Pharmaceutical Manufacturers, Helsinki, Finland.)

A method has been developed for the quantitative determination of micro amounts of atropine and scopolamine in the presence of large quantities of morphine. The components are first separated on an ion exchange column and the tropane alkaloids then colorimetrically determined. It is found that when solutions of relatively high methanol concentrations are used, the tropane alkaloids are not hydrolyzed by the strongly basic resin. By contrast, in aqueous solution, a considerable saponification takes place and the results obtained are consequently too low. The method has been applied to the determination of tropane alkaloids in injection solutions. The method is simple and gives satisfactory accuracy and reproducibility.

AUTHOR'S SUMMARY

HYDROLYSIS OF RITALIN

A Kinetic Study of Hydrolysis of Methyl DL-a-Phenyl-2-piperidylacetate, Siegel, S., Lachman, L., and Malspeis, L., J. Am. Pharm. Assoc., Sci. Ed. 48:431 (Aug.) 1959. (College of Pharmacy, Columbia University, New York, N. Y.)

The kinetics of the hydrolysis of methyl-DL-a-phenyl-2-piperidylacetate in aqueous buffers were studied over the pH range 1.1 to 6.1. The hydrolysis appears to be catalyzed specifically by hydronium and hydroxyl ions. The resulting catalytic catenary afforded a pH minimum of 2.86 at 80°. The pseudo first- and second-order velocity constants for hydronium and hydroxyl ion catalysis were determined and the temperature dependency of the reaction was studied. The influence of ionic strength on the hydronium and hydroxyl ion catalysis was investigated. The structural characteristics of the molecule contributing to the isocatalytic point are discussed.

AUTHOR'S SUMMARY

ODOR ADSORPTION

Studies on the Adsorption of Odorous Materials, Kopplin, J. O., Eaton, J. R., and Christian, J. E., J. Am. Pharm. Assoc., Sci. Ed. 48:247 (Aug.) 1959. (Electrical Engineering and Pharmacy Department, Purdue University, Lafayette, Ind.)

The measurement and classification of odors have been greatly handicapped by the lack of an objective instrument for the measurement of odor. This paper described experiments in which the detection of odorous material in low concentrations in an air stream was made by measuring the change in surface potential of an adsorbing surface in contact with the air stream. Various solid and liquid surfaces were used, including water. The effect of the presence of water vapor in the air stream on the changes in the surface potential of various surfaces was studied as well as the effect of increasing the temperature of the adsorbing surface. These tests indicate the possible use of surface phenomena for the detection of odorous material in the atmosphere.

AUTHOR'S SUMMARY

ANTIFUNGAL ACTIVITY OF SORBIC ACID DERIVATIVES

Synthesis and Antifungal Studies on Sorbic Acid Derivatives, Cronk, D., Zopf, L., and Jones, J., J. Am. Pharm. Assoc., Sci. Ed. 48:455 (Aug.) 1959. (State University of Iowa, College of Pharmacy, Iowa City, Iowa.)

Nine esters, one amide, and two amine salts of sorbic acid were prepared and tested against four pathogenic fungi by two methods. Of the twelve compounds, o-hydroxyphenyl sorbate, chlorothymol sorbate, isobutylamine sorbate, and morpholine sorbate exhibited the greatest activity.

AUTHOR'S SUMMARY

INVESTIGATION INTO THE PROCESS OF STERILIZATION

Relation Between the Temperature of the Sterilized Solution and that of the Sterilizator, Svirkow, A. I., Aptechnoe Delo (U.S.S.R.) 8, 4:13 (July-Aug.) 1959.

The relation between the temperature of the sterilized liquid and that of the sterilizator was studied. In this respect the conditions of work in pharmacies were taken into account. The following factors were involved: (1) chemical composition of the liquid (distilled water, solutions of 0.85% and 10% sodium chloride, 1% and 2% procaine chloride, 5 to 10% calcium chloride, 25% magnesium sulfate, 40% glucose, etc.), (2) volume of the liquid (100 ml., 200 ml., 500 ml., and 1000 ml.), (3) duration of the sterilization (30, 60, and 120 minutes). Among the many results the following are most important: After applying heat to the sterilizator during 30 minutes one obtains the same temperature in the liquids as in the sterilizator within 2 to 3, 4 to 5, 6 to 8, 10 and more minutes after putting 100 ml., 200 ml., 500 ml., and 1000 ml. respectively in the sterilizator. The greatest time differences were ascertained with respct to low

concentrations of substances and to distilled water. However, as far as the necessary duration of the sterilization is concerned, the concentration of substances lacked importance.

The author suggests prolongation of the usual sterilization times according to a table with two entries, *i.e.* volume of the liquid and the chemical composition of the dissolved substance. The additional times are 5 to 10 minutes.

HUBERT ŽÁČEK

PHENOBARBITAL IN LIQUID MIXTURES

Preparation of Phenobarbital Containing Liquid Mixtures, Solomakhina, L. K. and Filatova, A. C., Aptechnoe Delo (U.S. S.R.) 8, 3:54 (May-June) 1959.

The following notions based on experimental data are communicated: If the concentration of phenobarbital is not more than 0.1% the substance is to be dissolved in the total quantity of boiling waer; the cooled solution is then to be filtered into the flask. If more than 3% of the tincture of valeriana are part of the mixture, a solution of phenobarbital in this tincture eventually in alcohol 70° or 96° (3% and 2% respectively from the total quantity of the mixture) is prepared first of all. Thereafter the solution formed in this way is added successively while stirring to the mixture. The presence of 3 to 10% of salts in the mixture and diluting of the alcoholic solution of phenobarbital by water medium cause no precipitation of the solid substance from the solved state. When stored at 20°C the mixtures are stable during 4 or more days.

If the quantity of phenobarbital is greater than 0.1% the substance is to be solubilized by addition of sodium bicarbonate or suspended by means of gelatose. It was found that deviations from the declared content of phenobarbital in individual doses of the suspension prepared in this way were within tolerance limits.

HUBERT ŽÁČEK

VACUUM DRYING IN STERILIZATION

Vacuum Drying of Steam Dressings, Penikett, E., Rowe, T. and Robson, E., J. Applied Bacteriology 21:282 (Dec.) 1958. (E. J. Penikett, Department of Bacteriology, Guys Hospital Medical School, London.)

Sterilization of dressings and other items of cotton material is usually carried out in four stages: (1) removal of air, (2) exposure to steam under pressure, (3) drying, and (4) admission of sterile air. The drying process can be accomplished by "cracking" the door open, or pumping sterile air through the chamber to remove the water vapor, or reducing the pressure in the chamber below atmospheric pressure for a period of time. The first two methods tend to dry the dressings on the outside, but leave the inside damp. The use of the "cracked" door is condemned because of contamination with unsterile air; generally, sterilizers are not equipped with pumps to admit sterile air.

An investigation was conducted to ascertain the degree of vacuum and time of application needed to dry steam sterilized dressings. The materials, methods, and analysis of moisture content are described in detail. It was found that the subjective feeling of dryness of a cotton material corresponded to less than 5% of its dry weight of water. If the steam supply is dry and the dressings are not damp before sterilization and the pressure in the drying stage is reduced to absolute pressure of 50 mm. Hg, the dressings will be cool and dry without holding the vacuum.

NORMAN HO

TAMARIND POLYOSE AS EMULSIFYING AGENT

Tamarind Polyose as an Emuslifying Agent, Patel, R. P. and Raghundathan, Y., Indian J. Pharm. 21:159 (June) 1959. (Department of Pharmaceutical Technology, L. M. College of Pharmacy, Ahmedabad, India.)

The investigators compared emulsions prepared with tamarind polyose with those prepared with acacia, acacia and tragacanth, and starch with similar viscosities. It was shown that tamarind polyose suspensions are better dispersed as indicated from their interfacial areas. On centrifuging, emulsions prepared with tamarind polyose were found to have better stability than the other emulsions under investigation.

Tamarind polyose has an emulsifying property which compares favorably to acacia, although the viscosities of the former are greater.

Since tamarind polyose shows viscous properties similar to that of tragacanth, comparisons were made between acacia and tragacanth emulsions and acacia and tamarind polyose emulsions. Tamarind polyose emulsions prepared in combination with acacia show no creaming after storage for three weeks and less creaming on centrifuging.

Emulsifying properties of tamarind polyose are found best in emulsions of cod liver oil, liquid paraffin and peanut oil, while poor emulsifying properties have been observed with turpentine oil and benzyl benzoate.

THOMAS E. ARKINSON

PREPARING MOLD EXTRACTS

A New Method for the Preparation of Mold Extracts Using a Synthetic Medium, Schaffer, N., Molomut, N. and Center, J. Ann. Allergy 17:380 (May-June) 1959. (Dr. Nathan Schaffer, 98 S. Munn Ave., East Orange, N. J.)

A synthetic culture medium for the growth of molds in the production of mold extracts, which are significantly antigenic and free from nonspecific and irritating substances, is presented. The Center Mold Medium No. 1 is:

Sucrose (chemically pure, ash-free)	40. Gm.
Ammonium sulfate	2.0 Gm.
Ammonium nitrate	1.3 Gm.
Ammonium citrate	1.0 Gm.
Sodium citrate	2.0 Gm.
Potassium phosphate (monobasic)	0.15 Gm.
Potassium phosphate (dibasic)	0.15 Gm.
Ammonium phosphate (dibasic)	0.2 Gm.
Citric acid	1.0 Gm.
Potassium citrate	0.4 Gm.
Magnesium sulfate	0.25 Gm.
Calcium carbonate	0.8 Gm.
Trace elements stock solution	1.0 ml.
Distilled water, to make	1000 ml.

The trace elements stock solution contains copper sulfate 0.5%, manganese sulfate 0.5%, potassium dichromate 0.2%, zinc sulfate 0.5%, ferric sulfate 0.1% in distilled water.

The methods of preparation of the medium and extraction, concentration, and standardization of the mold extracts are explained. Twenty-one species of molds have been successfully cultured and yielded clinically reliable extracts.

A comparative clinical study was done on 100 patients sensitive to molds with extracts of 8 different molds prepared from the medium described, and the Czapek's Medium, another synthetic medium. The patients were skin tested using serial dilutions. All reactions to the extracts prepared by Center Mold Medium No. 1 were immediate and clinically more significant than extracts from Czapek's Medium.

NORMAN HO

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

. . . . . .

INTERNATIONAL

Avchin, Marij: Hospitals and Health Care in Yugoslavia, Part III, *Am. Profess. Pharmacist* 25:716 (Oct.) 1959.

LITERATURE

Stauffer, I.: Filing—What Will We Do? *Hosp. Pharm.* (Canada) 12:215 (Sept.-Oct.) 1959.

PARENTERAL SOLUTIONS

Teare, F. W.: Quality Controls for Hospital Manufacturing, *Hosp. Pharm.* (Canada) 12:217 (Sept.-Oct.) 1959.

GENERAL

Sperandio, G. J.: Extra Services the Pharmacist Can Offer, *Tile and Till* 45:opp.86 (Sept.-Oct.) 1959.

Tiemann, K. E. and Lofgren, F. V.: Pharmaceutical Procedures in the Pharmacy of a Hospital School, *Hosp. Management* 88:86 (Nov.) 1959.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► THE FOLLOWING MONOGRAPHS and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations. In order to make the material even more valuable, dosage forms and preparations of individual drugs have been added to the monographs. These dosage forms and preparations were not taken from material published in the *Journal of the American Medical Association* by the Council on Drugs; rather, they were obtained from such manufacturers' brochures, news releases, etc., which were available to us at the time of publication. An attempt has been made to make the list of dosage forms as complete as possible. However, no guarantee can be made that the list of preparations is complete and it is suggested that hospital pharmacists consult manufacturers' releases for additional dosage forms and preparations.

The issues of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of the JOURNAL include some of those published in the *A.M.A. Journal* for August 29 and September 19. Additional monographs for August 29 and September 19 appeared in the October and November issues of THIS JOURNAL.

Notice

New and Nonofficial Drugs 1959 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1959 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to January 1, 1959. The indexes listed below contain those drugs evaluated and published between December 20, 1958 and September 19, 1959*

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489 Steroid Therapy in Surgical Patients (Sept.)
563 Steroid Therapy in Systemic Infections (Oct.)
95 Sulfamethoxypyridazine (Feb.)
621 Syrosingopine (Nov.)
614 Tessalon (Nov.)
140 Thiopropazate Hydrochloride (Mar.)
622 Triacetin (Nov.)
140 Triamcinolone (Mar.)
373 Triamcinolone Acetonide (July)
96 Trilflupromazine Hydrochloride (Feb.)
487 Tuberculosis Vaccine (Sept.)
373 Undecoylium Chloride-Iodine (July)
488 Valethamate Bromide (Sept.)
96 Vesprin (Feb.)
419 Vancocin Hydrochloride (Aug.)
419 Vancomycin Hydrochloride (Aug.)
96 Vesprin (Feb.)
373 Virac (July)

NEW AND NONOFFICIAL DRUGS

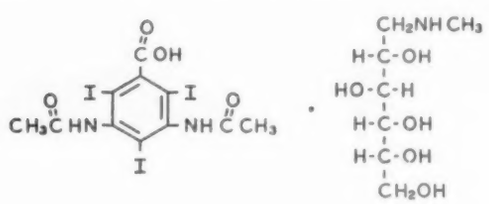
The following descriptions of drugs are based upon available evidence and do not in any case imply endorsement by the Council.

H. D. Kautz, M.D., *Secretary.*

Methylglucamine Diatrizoate

Cardiografin®
Gastrografin®
Renografin®

Methylglucamine Diatrizoate (Cardiografin, Gastrografin, Renografin) is diatrizoate methylglucamine.—The N-methylglucamine salt of 3,5-diacetamido-2,4,6-triiodobenzoic acid.—The structural formula of methylglucamine diatrizoate may be represented as follows:



Actions and Uses

Methylglucamine diatrizoate, a radiopaque water-soluble organic iodine compound is used as a roentgenographic contrast medium. Commercial preparations of this substance also contain some sodium diatrizoate, formed by the interaction of methylglucamine diatrizoate with sodium hydroxide added to adjust the pH of the solution. The actions and uses are similar to those of the sodium salt. (See the monograph on sodium diatrizoate in New and Nonofficial Drugs.)

When administered orally, methylglucamine diatrizoate is only slightly absorbed. After intravenous injection, it is excreted rapidly by the kidneys.

Methylglucamine diatrizoate has been used more extensively for intravenous excretory urography than for any other purpose. When thus used, it yields satisfactory urograms in a high percentage of patients. Excellent visualization of the renal collecting system is obtained in almost all patients with normal kidney function. Maximum opacity in pyelograms is usually seen within 15 minutes after injection. Adequate cystograms can be obtained earlier than with many other agents; cystograms made 25 to 40 minutes after injection are ordinarily satisfactory unless excretion is delayed by obstruction or other pathological conditions. In concentrations of 30 percent, methylglucamine diatrizoate is also satisfactory for retrograde pyelography, yielding roentgenograms of excellent contrast. The only disadvantage cited is the claim by a single observer that emptying of the renal pelves proceeds with troublesome rapidity.

Methylglucamine diatrizoate has also been used successfully for contrast visualization of the cardiovascular system. It yields satisfactory venograms, aortograms, and peripheral, cerebral, and coronary arteriograms. The viscosities of solutions of 30, 60, and 76 percent are such that mechanical injection through narrow-bore cardiac catheters can be performed successfully. The 85 percent solution is more viscous but may be used for angiography with a mechanical injector or a large-bore needle.

For roentgenographic examination of the gastrointestinal tract, methylglucamine diatrizoate solutions possess both advantages and disadvantages in comparison with the usual suspension of barium sulfate. Some patients find flavored preparations of methylglucamine diatrizoate more palatable than barium suspensions. In general, it provides good delineation of the stomach and first portion of the duodenum. Normal and abnormal mucosal patterns, in addition to ulcers and filling defects, are usually well demonstrated. The relatively low viscosity of the solution is advantageous

in demonstrating fistulous connections. The shadow density in the stomach and small intestine, however, is not as great as that provided by barium. Visualization of the esophagus is unsatisfactory because the solution traverses it rapidly without coating the esophageal wall. The small intestine is also poorly delineated. After oral administration, visualization of the colon is poor but somewhat better than that provided by barium. Methylglucamine diatrizoate is said to produce greater pyloric spasm than barium and to enhance gastrointestinal motility. This acceleration of intestinal activity results in optimal delineation of the colon in 6 hours, so that a 24-hour examination is unnecsssary. For retrograde intestinal studies, the relatively low viscosity of the solution is disadvantageous. To overcome this, methylcellulose may be added; wetting agents may also be incorporated and are said to improve the coating qualities of the preparation.

The incidence of side-effects after intravenous use of methylglucamine diatrizoate is relatively low. There is general agreement that such reactions occur no more frequently than with other organic iodine preparations, and several clinical investigators feel that the incidence is significantly lower. After intravenous injection, nausea is the most commonly observed reaction; flushing of the skin, itching, dizziness, salivation, vomiting, choking sensations, paresthesias, urticaria, sneezing, and venous pain occur less frequently. The incidence and severity of these reactions may be minimized by injecting the solution very slowly. After oral administration, mild diarrhea, which occurs not infrequently but which usually subsides spontaneously within 24 hours, is the only untoward effect reported.

The same potential dangers must be assumed to attend the use of methylglucamine diatrizoate in cerebral angiography as other radiopaque mediums; so far, few serious reactions have occurred. In experimental studies, it has been applied directly to the cerebral cortex without causing seizures. In human patients, transient hemiparesis, seventh nerve weakness, and temporary apnea have been reported.

Intramuscular injection, customarily in the gluteal region, produces considerable local discomfort, sometimes accompanied by paresthesias of the lower extremities. Symptoms ordinarily subside within 24 hours.

Chronic toxicity studies in animals have revealed no serious toxic effects. In animals, 40 percent solutions injected subcutaneously, applied to the skin, or instilled in the eye produce no local irritation. Solutions of 30 percent concentration are not irritating when injected intraperitoneally or instilled into the bladder. However, intramuscular injections of 76 percent solutions diluted with an equal volume of distilled water produce considerable irritation. The inflammatory reaction usually subsides within a week.

As noted previously, the uses of methylglucamine diatrizoate as a radiopaque contrast medium are similar to those of other soluble organic iodine compounds. Its value for intravenous urography is well established by a substantial number of cases, and it is comparable to the best of other such agents both in the quality of the urograms produced and in the low incidence of undesirable side-effects. It has also proved eminently satisfactory for the various types of angiography. For roentgenographic examination of the gastrointestinal tract, it is, in general, less satisfactory than the standard barium suspension. However, it may be useful in the occasional patient who refuses to accept barium, in those patients in whom inspissation of the barium is especially to be feared, and in demonstrating those lesions for which a solution of low viscosity is required.

Methylglucamine diatrizoate is contraindicated, or should be used with caution, in the presence of severe hepatic or renal disease, hyperthyroidism, or tuberculosis.

Dosage

Methylglucamine diatrizoate in suitable concentrations may be administered orally, rectally, intravenously, intra-arterially, intramuscularly, or instilled into the genitourinary tract. It should be remembered that this substance, like other organic iodine compounds, may occasionally cause severe or even fatal anaphylactoid reactions when injected intravenously. Skin or ocular testing is probably of little value in predicting such reactions. A test dose of 1 cc. may cautiously be injected intravenously before the full dose is given, although even such a test dose may cause death in hypersensitive individuals. (See the general statement on water-soluble organic iodine compounds for roentgenography in New and Nonofficial Drugs.)

When used for intravenous excretory urography in adults, 20 cc. of a 76 percent solution is injected slowly into the antecubital vein, the full dose being given over a period of three to five minutes; 25 cc. of a 60 percent solution also yields satisfactory results. The dose for infants is 5 cc. of a 76 percent solution; for young children, 10 cc.; and for older children, 15 cc.

When administered by deep intramuscular injection for excretory urography, the 60 percent solution is used. The dose is the same as the intravenous dose but is given in two divided doses, one in each buttock.

In retrograde pyelography, 15 cc. of a 30 percent solution is ordinarily adequate for unilateral pyelograms. Approximately 5 cc. may be sufficient for each exposure. The solution may be introduced either by syringe or by a gravity flow system, but, regardless of the system used, injection of the contrast medium should be terminated as soon as the patient complains of a sense of fulness or pain in the region of the kidney.

For peripheral arteriography, the 60 or 76 percent solution is injected rapidly into the femoral or subclavian artery. For visualization of the entire extremity, 20 cc. is injected; for the upper half or lower half only, 10 cc. may be sufficient. Since the drug must be injected rapidly for this purpose, side-effects such as nausea, vomiting, and flushing of the skin are relatively frequent. For angiocardiography and aortography in adults the 85 percent solution is used; in children, the 76 percent solution is employed. For cerebral angiography a 60 percent solution is used in single doses of 10 cc., repeated as indicated.

For venography, 20 cc. of a 60 percent solution is sufficient for visualization of an upper extremity and 10 cc. for a lower extremity.

For oral administration prior to roentgenography of the gastrointestinal tract, 30 to 90 cc. of a 76 percent solution is given. The exact amount required will depend on the nature of the examination and the size of the patient. For infants and children up to five years of age, 30 cc. may be given; the dose for older children is 60 cc. If desired, the solution may be diluted with an equal volume of water, carbonated beverage, milk, or mineral oil. Such dilution, however, may result in some loss of contrast in the roentgenogram.

For retention enemas, 240 cc. of a 76 percent solution diluted to 1,000 cc. is satisfactory. For children, 90 cc. diluted to 500 cc. is usually adequate.

Preparations.—solution (oral) 76 percent; solution (injection) 60 percent in 25 cc., 76 percent in 20 cc., 85 percent in 50 cc.; solution (intracavitary) 30 percent in 50 cc.

Year of introduction: 1955.
E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of methylglucamine diatrizoate.
*J.Am.Med.Assoc. 171:*141/301 (Sept. 19) 1959.

Preparations

Injection Methylglucamine Diatrizoate (Cardiografin) 85 percent; 50 ml. vials.
Injection Methylglucamine Diatrizoate (Cardiografin) 85 percent, 50 ml. vials; 60 percent, 25 ml. vials; and 76 percent, 20 ml. ampuls.
Solution, Oral, Methylglucamine Diatrizoate (Gastrografin) 76 percent; 120 ml. bottles.

REPORT TO THE COUNCIL

The Council has authorized publication of the following report.

H. D. KAUTZ, M.D., *Secretary.*

OCCURRENCE OF SERIOUS BACTERIAL INFECTIONS SINCE INTRODUCTION OF ANTIBACTERIAL AGENTS

MAXWELL FINLAND, M.D., WILFRED F. JONES JR., M.D. *and* MILDRED W. BARNES, M.S., *Boston*

► THE INTRODUCTION AND WIDESPREAD use of chemotherapeutic and antibiotic agents has resulted in profound changes in the number and character of infections that are being encountered. Emphasis has been placed most recently on the number and seriousness of staphylococci infections, particularly those occurring within hospitals. This has been brought strikingly into our consciousness because of the large number of outbreaks in nurseries and maternity wards and by the high incidence of infections in originally clean surgical wounds and as complications of debilitating diseases, events which have resulted in considerable morbidity and appreciable mortality within hospitals. There is also some evidence of extension of these infections into the communities. The problem has been recognized as being worldwide and extending to all areas where antibiotics have been extensively used. It has also been the subject of many conferences and of a number of monographs.[1]

Although the staphylococcus problem has received considerable attention and emphasis from many workers, a number of others have also become impressed recently with the increasing prevalence and seriousness of other groups of infections, particularly those of the coliform organisms. This term will be used loosely to include various aerobic gram-negative bacilli (other than the so-called enteric pathogens, namely the salmonellas, shigellas, and specific strains of Escherichia coli) that are usually considered to be normal constituents of the fecal flora, especially the common species of Escherichia, Klebsiella-Aerobacter, Alcaligenes, Proteus, and Pseudomonas. As with the staphylococcus, the concern about such infections has been due, in a large measure, to the fact that a major proportion of these organisms are relatively resistant in vitro to most of the widely available antibacterial agents and that the infections caused by them respond poorly to treatment with these drugs and are the cause of an increasing number of deaths. A few reports of cases of serious gram-negative bacillary infections, particularly those with bacteremia, have appeared during the last few years.[2] Some of these patients have demonstrated one particularly dramatic feature of these infections, namely bacteremic shock.[3]

In spite of these reports and of some general appreciation of these problems, there is a dearth of reliable information as to the incidence of staphylococcic infections, particularly with respect to their importance as a cause of serious disease and deaths since the introduction of modern antibacterial drugs.

Few, if any, of the numerous reports have dealt with the changes in the frequency with which serious and fatal infections with these and other bacteria are being encountered in the same hospitals since the advent of modern chemotherapeutic drugs. This may be due, in part, to the nature and general prevalence of these organisms and the fact that they are most frequently present in the absence of disease, and, in part, to the wide spectrum of infections which may be caused by each of these different organisms. These factors often make it difficult to determine their true significance when such organisms are grown in cultures from any given patient.

It would, of course, be of great interest to determine to what extent changes have taken place in the character of bacterial infections throughout the population. This is obviously impossible, not only because of the great difficulty in obtaining information about the bacterial etiology of infections on any appropriate scale outside of hospitals but also because there is no base line available for comparison with the current or recent status. Such information should be available in some hospitals.

The data presented in this paper were, therefore, gathered in response to this need for reliable information on the changing pattern of serious staphylococcic and other specific bacterial infections in relation to the use of the antimicrobial agents. They were collected at the Boston City Hospital where there has been a continuous interest in infectious disease antedating the introduction of the sulfonamides, and where there is available a large amount of bacteriological material carried out by the same competent and conscientious bacteriologists throughout the same period.

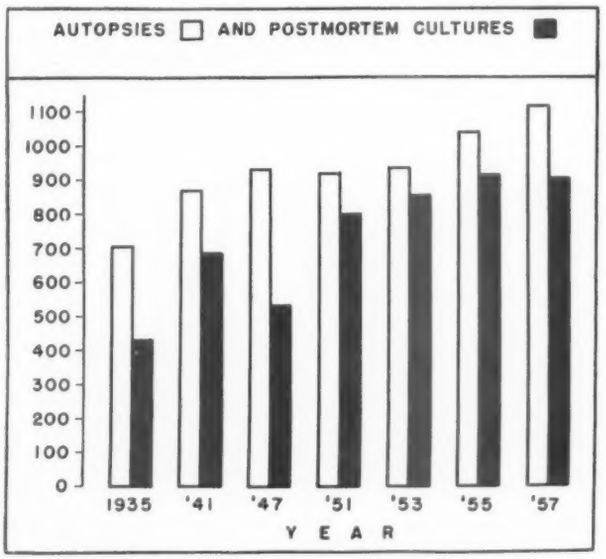


Fig. 1.—Autopsies performed and postmortem cultures made in selected years at Boston City Hospital.

Methods and Limitations of Study

The large volume of material that was available necessitated limiting this survey to certain key years and to certain clearly defined entities. The following years were therefore chosen for the survey: 1935, the year before the introduction of sulfanilamide and its derivatives; 1941, after the sulfonamide drugs had achieved wide use and before penicillin became available; 1947, after penicillin and streptomycin had already

From the Thorndike Memorial Laboratory, Second and Fourth (Harvard) Medical Services, Boston City Hospital and the Department of Medicine, Harvard Medical School. Dr. Jones is now at the Harlan Memorial Hospital, Harlan, Ky.

Read in part before the 72nd annual meeting of the Association of American Physicians, Atlantic City, May 6, 1959.

been used widely and intensively and before the introduction of the broad-spectrum antibiotics; 1951, after some of the broad-spectrum antibiotics had already come into wide use and before the introduction of erythromycin and other antistaphylococcic antibiotics; and 1953, 1955, and 1957, in order to define recent trends after most or all of the currently available antibiotics had already been widely and extensively used.

In order to make valid comparisons and also to minimize errors in interpretation, as well as to limit the study still further, only the following entities were included: (1) autopsies in which satisfactory cultures were made and which yielded bacterial pathogens; (2) bacteremias (organisms grown from blood cultures); (3) meningitides (bacteria grown from cerebrospinal fluid); and (4) empyemas (bacteria grown from pleural fluid). Excluded from consideration within these categories were cultures positive for diphtheroids, Bacillus subtilis, staphylococci other than Staphylococcus aureus or Staphylococcus albus, and unidentified aerobic gram-negative bacilli which were either chromogenic or failed to give biochemical reactions characteristic of the common varieties of coliform organisms. Tubercle bacilli were also arbitrarily excluded from consideration.

The results of all bacteriological cultures made during the years of the survey were reviewed in detail and those from which significant organisms were grown from blood, cerebrospinal fluid, or pleural fluid were selected. The hospital records of the patients from whom these cultures were made during life were obtained and examined. For the purposes of the present analyses, only the age of the patient and the final result (that is, whether the patient died or recovered before leaving the hospital) were used. Parallel studies in patients in whom all such cultures were negative were not attempted because it was felt that the data derived could not be readily interpreted. As to the autopsies, the only aspects mentioned in this report are the finding of Staph. aureus in the postmortem cultures and whether or not this staphylococcus was demonstrated as the only or predominant organism in the cultures from some significant site.

Background Information

The background data from which this material was selected are given in figures 1 and 2. During the period of this study, the total number of admissions to the hospital rose above 43,000 in 1941 and then fell of to 33,600 in 1957, a drop of over 20%. During the same interval, the number of cultures processed in the bacteriological laboratory increased almost fivefold, from about 10,000 in 1935 to nearly 50,000 in 1957. Hereafter, the data will refer to the numbers of patients and not to the numbers of positive cultures.

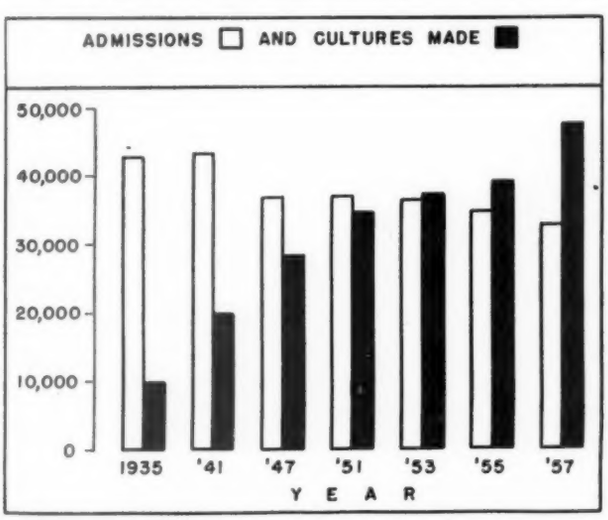


Fig. 2.—Admissions and cultures made in selected years at Boston City Hospital.

The total number of deaths each year from all causes is shown in the table. This number fluctuated somewhat but had a general downward trend, almost paralleling that of the total number of admissions, with about 17% fewer deaths in 1957 than in 1935. The number of deaths from all causes per 100 admissions to the hospital fluctuated somewhat throughout this period but generally was about seven.

The number of autopsies performed at the hospital (fig.1) increased from about 700 to over 1,100, and those in which bacteriological cultures were made increased more than proportionally. The autopsy percentage for the entire hospital, that is, the proportion of fatal cases in which autopsies were performed, increased during the interval of this study from about 25% to nearly 50% (see table).

Staphylococci in Postmortem Cultures

Cultures made at autopsy are often difficult to interpret without much more detailed study than was made in the present survey. Therefore, it is possible to present, at this time, only certain crude data that may have some bearing on the occurrence and significance of staphylococcic infections; these are shown in the table. During the interval of this survey, the number of autopsies performed each year increased about 60%, but the number that yielded Staph. aureus increased to a much greater extent. The number of autopsies that yielded this organism in pure culture or as the only or predominant organism from one or more important sites (as far as could be determined from the bacteriological reports) likewise increased far out of proportion to the increase in the number of autopsies in which cultures were made. This may be taken as a very crude index of the increasing significance of Staph. aureus as a major or contributing cause of death.

Occurrence of Bacteremia

The most significant trends were revealed by the cases of bacteremia. The numbers of patients with blood cultures positive for the most common gram-positive coccal organisms (other than Staph. albus, which will be considered separately later in this paper) are indicated in figure 3, and those whose blood cultures yielded the most common of the various important gram-negative bacteria are shown in figure 4. Pneumococcus was the most frequent invader of the blood stream in 1935; since then the number of patients with pneumococcic bacteremia has fluctuated slightly and showed a significant drop only in 1955 and 1957. Cases of hemolytic streptococcic (Streptococcus pyogenes) bacteremia were about half as frequent as those with pneumococcus in 1935, but their number declined sharply in the sulfonamide era. Very few such cases have been encountered since then and until 1957, when a moderate number again occurred. The numbers of patients with bacteremia due to streptococci of the viridans group fluctuated slightly and irregularly. On the other hand, enterococcic bacteremias were almost unknown or unrecognized before the antibiotic era, but there have been 23 to 36 cases each year since then. The greatest and most significant increase occurred in the number of patients with bacteremia due to Staph. aureus. There was a sharp increase in 1941, a temporary decline after the early use of penicillin, and a steady increase thereafter. In 1957 there were nearly four times as many cases as in 1935 and more than twice as many as in 1947.

The occurrence of invasion of the blood stream with various gram-negative bacilli showed an even more striking trend. These bacteremias were infrequently observed prior to the sulfonamide era, cases of Esch. coli bacteremia accounting for the great majority of those seen in 1935. Patients with Esch. coli bacteremia increased in number markedly after the introduction of the antibacterial drugs. Large numbers of cases have continued to occur since then, except for a temporary and partial remission after 1947, that is, after the broad-spectrum antibiotics came into use. Klebsiella pneumoniae (Friedlander's bacillus) bacteremia occurred in a small number of patients each year, with a moderately increased number

Autopsies Performed and Occurrence of Staphylococcus Aureus in Postmortem Cultures in Each Year of Survey

Year	Admissions, No.	Deaths, No.	Deaths, %	Autopsies Performed	Deaths, %	Autopsies Cultured	Autopsies Yielding Staph. Aureus: Total No.	Total %*	Pure or Predominant No.	Pure or Predominant %*
1935	39,274	2,749	7.0	704	25.6	485	126	28.9	32	7.4
1941	43,178	2,698	6.2	869	32.2	685	268	39.2	101	14.7
1947	38,463	2,904	7.6	934	32.2	535	215	40.2	86	16.1
1951	39,412	2,698	6.8	913	33.8	795	326	41.0	193	24.3
1953	37,557	2,617	7.0	934	35.6	856	339	39.6	142	16.9
1955	34,798	2,513	7.2	1,039	41.3	914	410	44.8	294	32.2
1957	33,604	2,276	6.8	1,113	48.9	904	431	47.7	223	24.7

* = % of autopsies cultured.

in 1953. Aerobacter aerogenes had not been identified in blood cultures at all until after 1941; however, in 1947, bacteremia with this organism occurred in 46 patients, and there have been about that number of cases each year since then. Pseudomonas bacteremia was rare in 1935, but there has been a moderate and steadily increasing number of cases each year since then (up to 20 in 1957). There were six and seven patients with Proteus bacteremia in 1935 and 1941, respectively, and the number rose sharply during the antibiotic era until there were 65 cases in 1955 and somewhat fewer in 1957. Proteus organisms thus vie with Esch. coli for top place among the gram-negative bacteremias. Not shown in the figure are the cases of bacteremia due to Hemophilus influenzae and various species of Salmonella, including S. typhosa. These accounted for a small and fluctuating number of cases each year.

Occurrence of Bacterial Meningitides

The numbers of cases of meningitis due to the most common pathogenic bacteria are shown in figures 5 and 6. The pneumococcus (fig. 5) caused the largest number of cases through 1951, with irregular fluctuations in the numbers occurring subsequently and a sharp drop only in 1957. Some

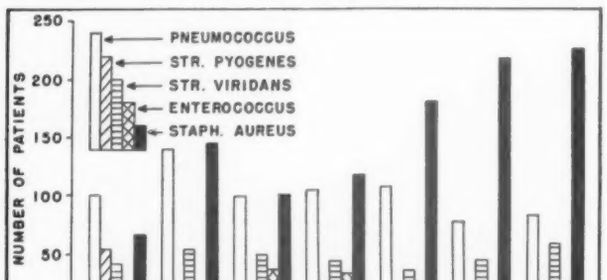


Fig. 3.—Bacteremia—occurrence of gram-positive cocci in blood cultures.

of these fluctuations are undoubtedly the result of the varying numbers of cases in which a definite diagnosis of the disease was established (cases of purulent meningitis with pneumococcic bacteremia) but are not included because cultures of the cerebrospinal fluid were sterile due to the administration of highly active antibiotics prior to the initial lumbar puncture. Thus, the drop in the number of cases of pneumococcic meningitis in 1957 is more apparent than real. A review of the records of patients with pneumococcic bacteremia during that year uncovered more than 20 patients in whom blood cultures were positive for pneumococci at the time of admission and who had signs of meningeal irritation with evidence of reaction in the cerebrospinal fluid. However, the first lumbar puncture in these cases was done after effective antibiotics had already been administered and both the blood culture and cerebrospinal fluid at that time yielded no growth. There were other such cases, but fewer in number, in each year after 1935.

Hemolytic streptococcic meningitis was second in frequency in 1935. The number of cases declined sharply after the introduction and widespread use of penicillin, and it has only rarely been encountered after 1947. Enterococci were not grown from the cerebrospinal fluid of patients with meningitis in 1935; they were first recognized during the sulfonamide era and have since increased to about the extent to which the cases of hemolytic streptococcic infections have decreased. Other streptococci, namely those of the viridans group and of specific groups other than A and D, showed a marked and irregular increase during the period of this survey and, taken together, were the most frequent gram-positive coccal organisms encountered in meningitis in 1955 and 1957. Meningitis

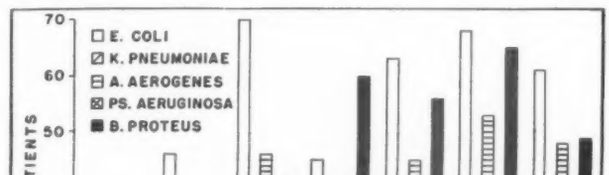


Fig. 4.—Bacteremia—occurrence of gram-negative bacilli in blood cultures.

due to Staph. aureus likewise increased from 3 cases in 1935 to 18 cases in 1947, and there have been about that many cases in each of the subsequent years of this study.

Among the cases of meningitis due to gram-negative organisms (fig. 6), the numbers of those caused by meningococcus or H. influenzae fluctuated irregularly during the years of

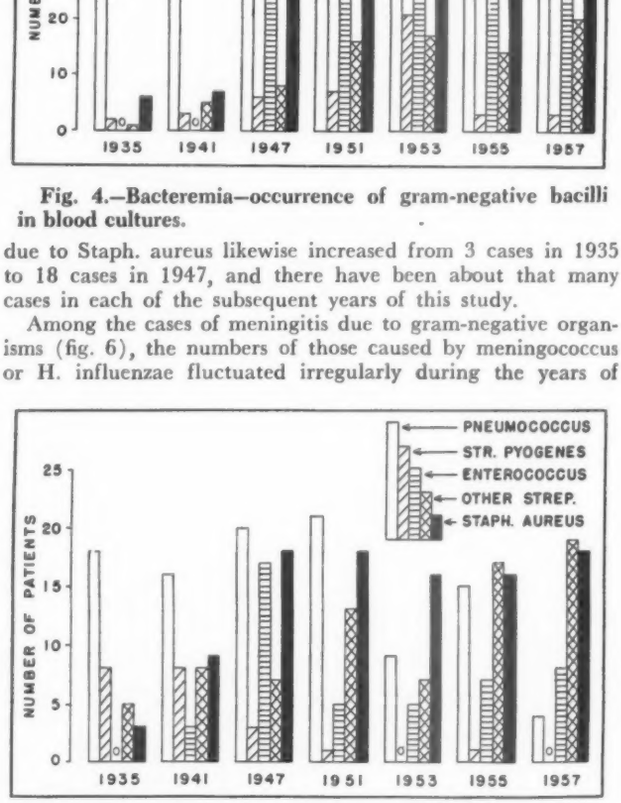


Fig. 5.—Meningitis—occurrence of gram-positive cocci in cerebrospinal fluid.

the survey. Cases of Esch. coli meningitis apparently increased through 1947, then declined sharply, and have been infrequent since then. On the other hand, cases of meningitis due to other gram-negative bacilli, which include mostly Aerobacter,

Proteus, and Pseudomonas organisms, were infrequent at first; these increased markedly during the antibiotic era to a total of 33 cases in 1955, with an intervening drop in 1951 and another drop in 1957.

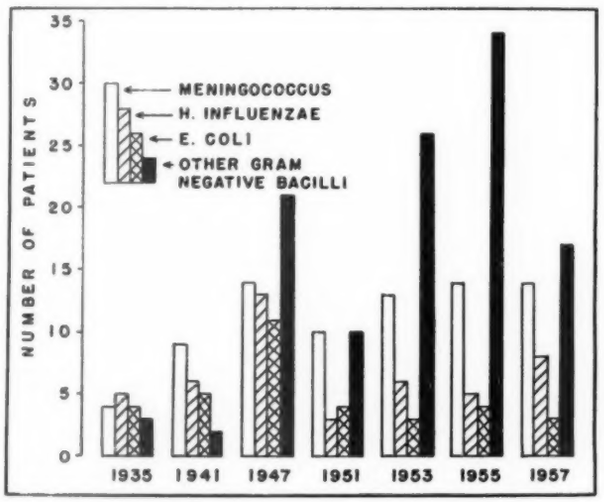


Fig. 6.—Meningitis—occurrence of gram-negative organisms in cerebrospinal fluid.

Occurrence of Empyema

In the cases of empyema (fig. 7 and 8), as in the meningitides, the pneumococcus was the most frequently found organism, and hemolytic streptococcus was second in frequency in 1935. The number of pneumococcic empyemas (fig. 7) declined sharply and steadily from 46 cases in that year to only 5 or 6 in each of the last three years that were surveyed. Meanwhile, the numbers of hemolytic streptococcic empyemas dropped to or near the vanishing point after penicillin and the other antibiotics achieved wide use. Here, too, enterococci were first encountered in empyemas after the sulfonamide era and were obtained in 7 to 15 cases in each of the subsequent years. Empyemas due to other streptococci (the viridans group, anaerobic or microaerophilic varieties, or those of groups other than A and D) were frequently encountered before and during the antibiotic era. Empyemas due to Staph. aureus decreased in number after 1941 after the introduction of penicillin and other antibiotics and reached a low point in 1951, but they have increased in number in the more recent years to about the prepenicillin level.

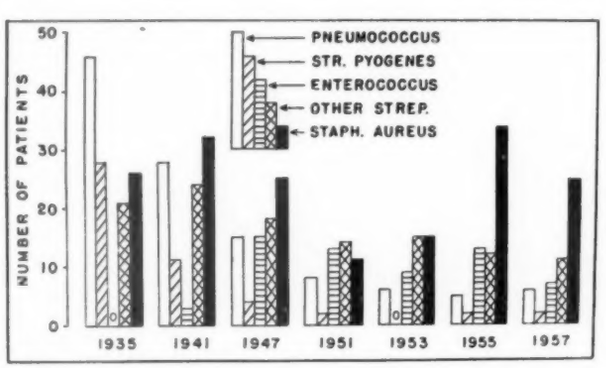


Fig. 7.—Empyema—occurrence of gram-positive cocci in pleural fluid.

The occurrence of other organisms in empyemas is depicted in figure 8. H. influenzae accounted for five cases or less each year. Esch. coli was obtained from eight patients in each of the first three years that were surveyed and from only three or four patients in each of the later periods. Organisms of the Klebsiella-Aerobacter group were rare in empyemas before 1947 when there were 9 cases; since then there have been 3 to 13 cases each year, only 1 to 3 of them due to Friedlander's bacillus. Other gram-negative bacilli, Proteus, Pseudomonas, Bacteroides, or unidentified, species, have accounted for 10 to 20 empyemas each year, with irregular fluctuations. Other organisms, chiefly clostridia, fusiform bacilli, and spirilla, were the most frequently found bacteria in 1935 and caused 27 cases of empyema. This number declined steadily to less than one-third of that number by 1947 and remained at about that level since then.

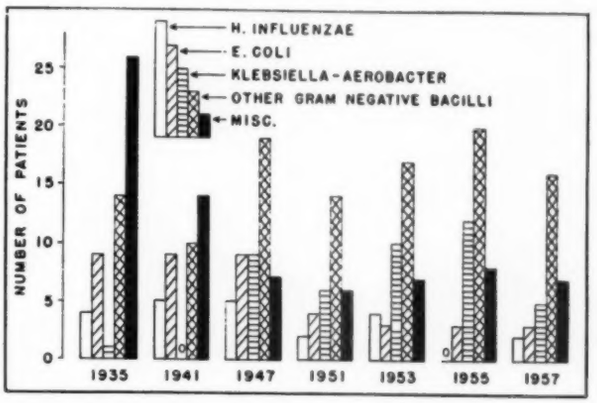


Fig. 8.—Empyema—occurrence of various organisms in pleural fluid.

Deaths in Patients with Bacteremia

Most revealing were the trends in the actual number of deaths among patients with blood cultures positive for various bacteria (fig. 9 and 10). Pneumococcus and hemolytic streptococcus (fig. 9) caused the largest number of deaths in 1935 (78 and 39 respectively). The number of deaths in patients with pneumococcic bacteremia declined markedly with the successive introduction of the sulfonamides and antibiotics; fatal hemolytic streptococcic bacteremias declined sharply after 1935, and there have been very few deaths in such cases or none at all in the years surveyed during the antibiotic era. Deaths in patients with Streptococcus viridans

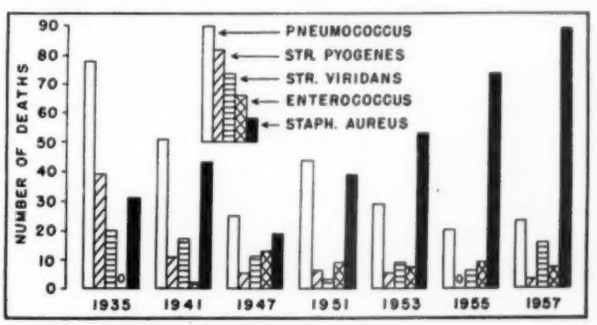


Fig. 9.—Bacteremia—deaths in patients with gram-positive cocci in blood cultures.

bacteremia decreased steadily to 1951 but were again occurring in moderate numbers in 1957. There were no fatal cases of enterococcic bacteremia in 1935, but these accounted for 5 to 13 deaths each year from 1947 on. The number of deaths in patients with Staph. aureus bacteremia decreased markedly after 1941 when penicillin came into wide use, but the numbers of such deaths have increased nearly fivefold between 1947 and 1957.

Deaths among patients with gram-negative bacillemias (fig. 10) showed equally striking trends. Except for a slight remission in 1951, after the introduction of the broad-spectrum antibiotics, the number of fatal cases of Esch. coli bacteremia increased steadily from 10 in 1935 to 30 in 1953,

and there have been about the same number in each of the later years. A. aerogenes was first encountered in the blood of fatal cases during the antibiotic era; since 1947, however, the number of deaths in patients with Aerobacter bacteremia have closely approximated those in which Esch. coli was the invader of the blood stream. The number of fatal cases of Pseudomonas bacteremia increased steadily from

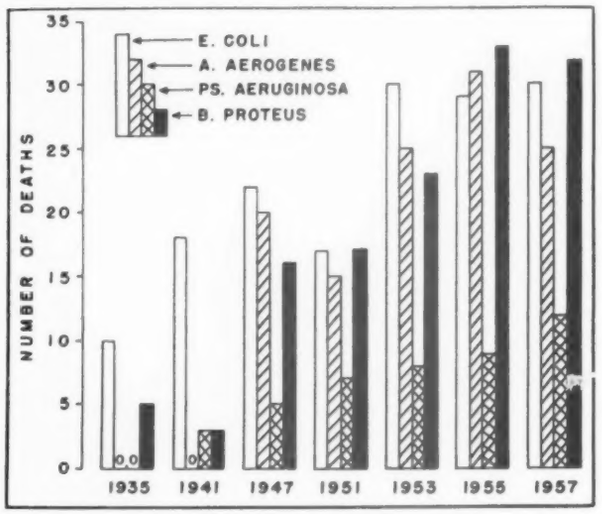


Fig. 10.—Bacteremia—deaths in patients with gram-negative bacilli in blood cultures.

none in 1935 to 13 in 1957. Highly significant was the increasing number of deaths among patients with Proteus bacteremia which increased from 3 to 5 in each of the preantibiotic years to more than 30 deaths in 1955 and 1957.

Summary of Occurrence and Mortality

Patients with Bacteremia.—The total numbers of patients and deaths for each year of the study are summarized for

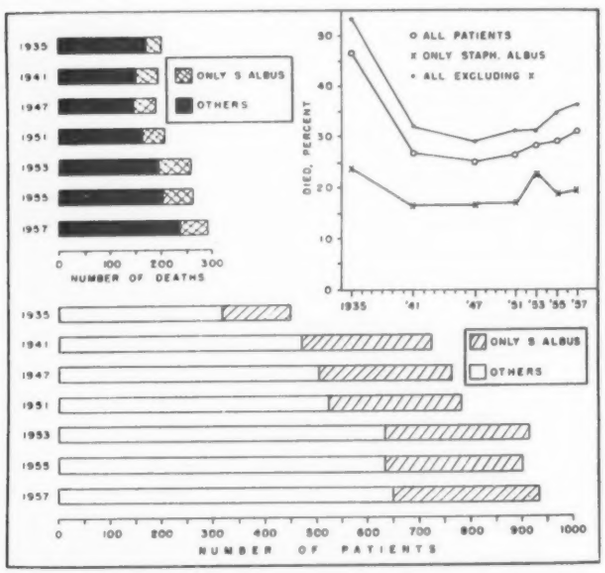


Fig. 11.—Patients with positive blood cultures—occurrence and mortality.

all the bacteremias in figure 11. Patients in whom Staph. albus was the only organism grown in the blood cultures are also indicated separately in this figure; however, those whose blood yielded only other organisms that were considered to be contaminants, notably diphtheroids, B. subtilis, and unidentified gram-negative bacilli, were excluded entirely. From the lower portion of figure 11, it is seen that the total numbers of patients whose blood cultures yielded significant pathogens increased more or less steadily over the entire period of the study, whereas those with blood cultures positive only for Staph. albus fluctuated only slightly after 1941. The total number of deaths in each of the successive years of

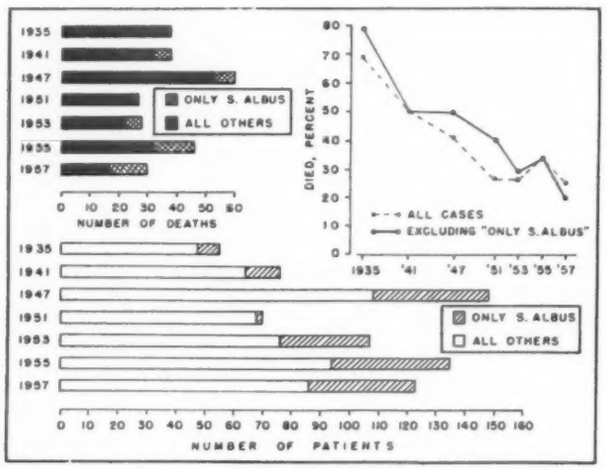


Fig. 12.—Bacterial meningitis—occurrence and mortality.

the survey (shown in the upper left portion of figure 11) declined only slightly from 1935 through 1947, but the number of deaths has been increasing steadily since then and has rapidly surpassed the number that occurred in 1935. By 1957 there were nearly 50% more deaths among patients with bacteremia than there had been in 1935.

The case fatality rates for the different years of the study

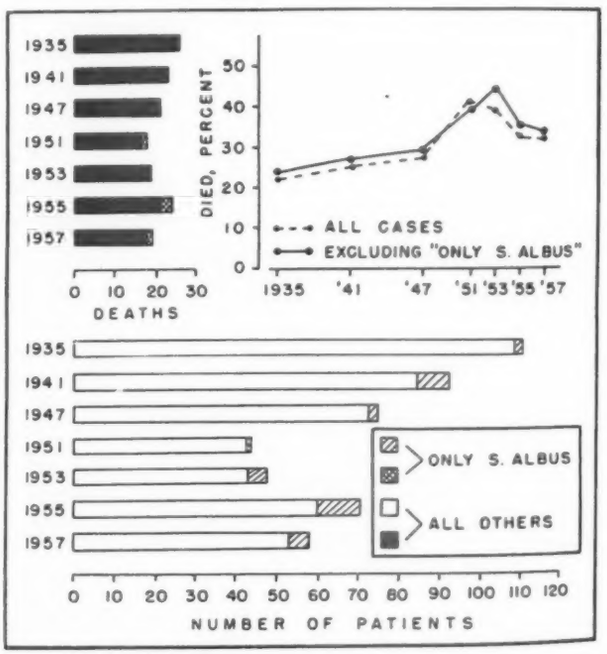


Fig. 13.—Empyema—occurrence and mortality.

for all patients with bacteremia and for those in which Staph. albus was the only organism in blood cultures are shown in the upper right panel of figure 11. The greatest drop in death rates in the bacteremia cases, irrespective of whether or not those yielding only Staph. albus are included,

occurred during the sulfonamide era; only a relatively small further decline occurred between 1935 and 1941. Since 1947, however, the case fatality rates have been climbing slowly but steadily, although they are still far below the 1935 level. The case fatality rate in the cases having only Staph. albus was much lower than in the others and showed only minor fluctuations.

Patients with Meningitis.—The over-all picture for the patients with bacterial meningitis is shown in figure 12. As shown in the lower portion of the figure, the total number of patients with all forms of bacterial meningitis fluctuated throughout the study, with a generally increasing trend. The number of deaths also fluctuated, but with a generally decreasing trend, as depicted in the left upper part of the figure. The case fatality rates for all cases of meningitis are summarized in the upper right panel of figure 12. There was a marked and more or less steady fall in these rates over the entire period of the study for all of the cases, whether or not those yielding only Staph. albus are included.

Patients with Empyema.—A similar representation of the data for all of the empyemas is offered in figure 13. Here it is seen that both the numbers of patients with empyema and the numbers of deaths among them declined steadily from 1935 through 1951, but both have shown an increasing trend since then. The case fatality rates, however, showed a generally increasing trend at first, followed by a somewhat decreasing trend.

Occurrence and Mortality of Patients with Positive Blood Cultures in Relation to Age

In order to evaluate the effect of possible changes that may have occurred in the age distribution of patients during the period of this survey, an analysis was made of the occurrence of positive blood cultures in patients of different age groups in each of the individual years of the study. Figure 14 shows the distribution, by decades of age, of the patients in each of these years. There was steady increase in the number of patients and deaths in the oldest age groups (those of the seventh decade or older). The number of infants and children under 10 years of age who had positive blood cultures fluctuated at first and then increased sharply after 1953. This latter rise is a reflection of the more thorough study that such patients have been receiving after reorganization of the pediatric service of the Boston City Hospital, which, at that time, became a university-affiliated service with a full-time senior staff.

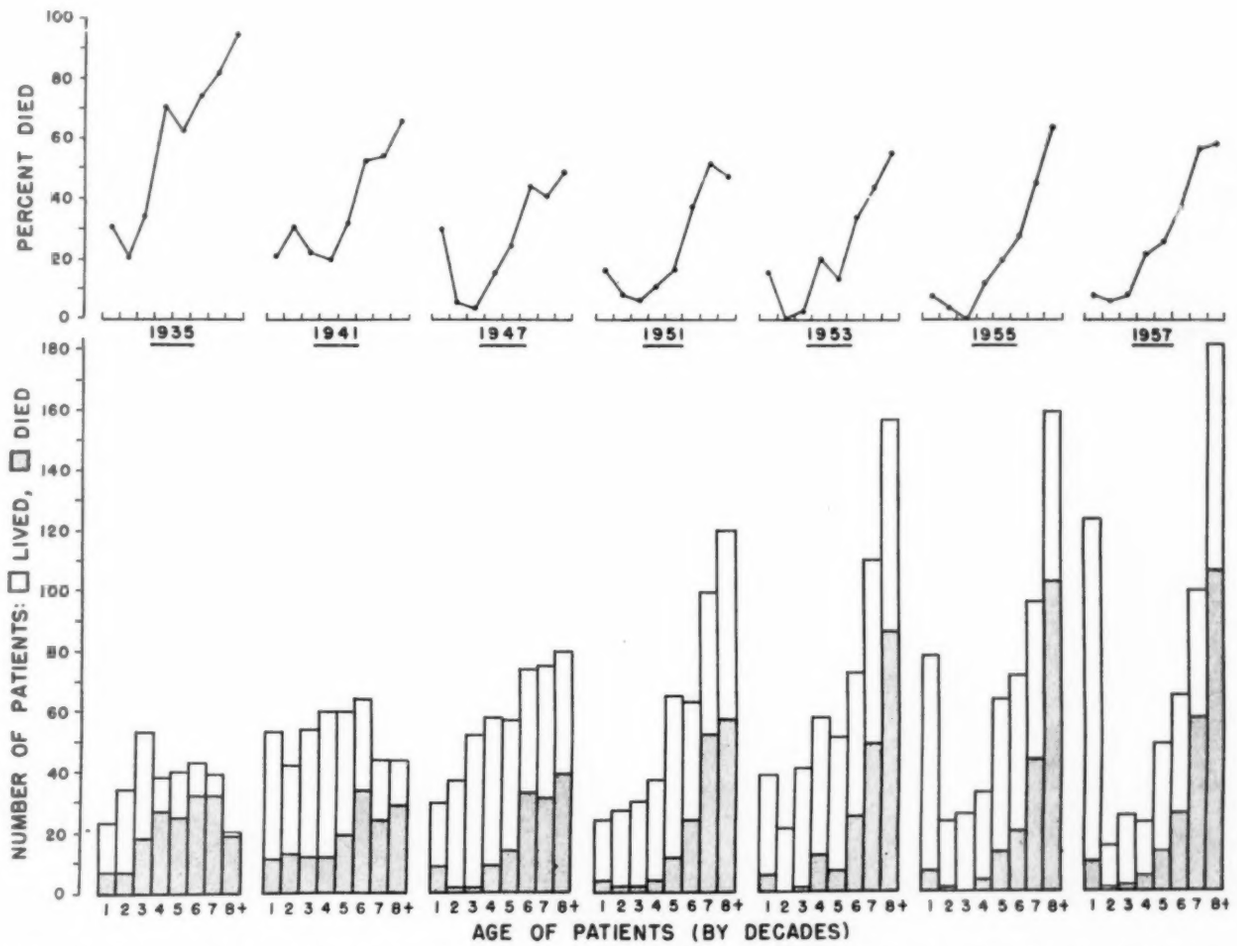


Fig. 14.—Occurrence of positive blood cultures and outcome in different years according to age of patients (excluding those with only Staph. albus).

The case fatality rates in the successive age groups, as shown in the curves depicted in the upper portion of figure 14, are all very similar for the different years. They show a drop in mortality after the first decade of life, low rates in the second and third decades, and steady and sharp rises in succeeding decades of age. In addition, these curves show the decline in death rates through 1947 in all age groups, this decline continuing in the younger decades through 1955;

these lower fatality rates are followed in later years by a rise in mortality involving patients of all ages except those under 10 years. This is shown more clearly in figure 15, in which the same data are charted so as to show the case fatality rates in the different years of the study among patients of each age group. The mortality curves, shown in the upper portion of this figure, are similar in each age group and reflect the drop in mortality through 1947 as well as the recent rise among patients of each age group except those under 10 years old.

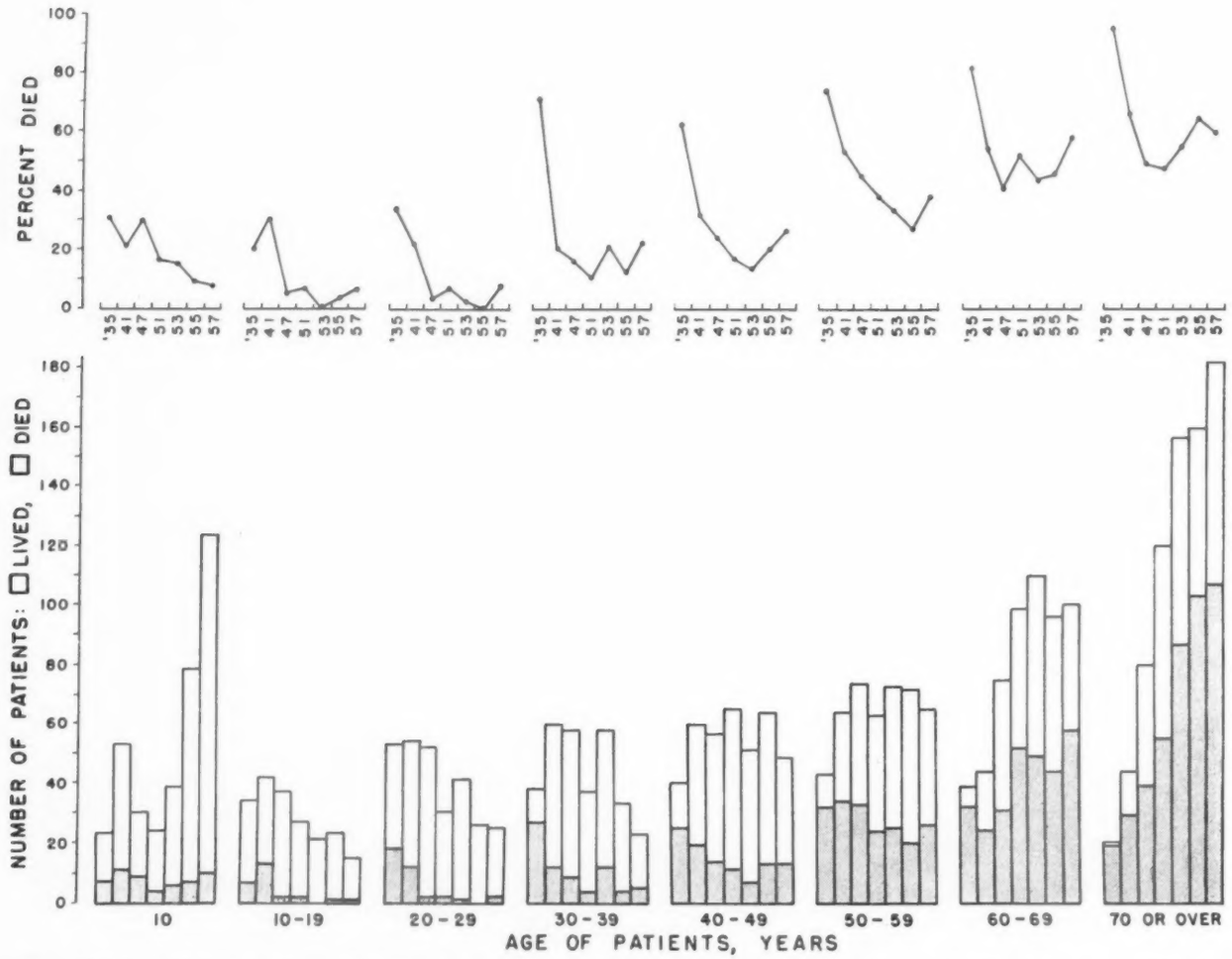


Fig. 15.—Number and outcome of patients of various ages having positive blood cultures in the years surveyed (excluding those with only Staph. albus).

Blood Cultures Positive Only for Staph. albus

Detailed studies of all the patients or of their hospital records were not included in this survey. The true significance of the occurrence of various organisms, paticularly in routine blood cultures, cannot therefore be attested for all of the patients. In many instances careful study of the records, or even personal observations of the patients, have failed to provide conclusive evidence of the pathogenic role of the particular organism that was cultured. This is especially true of Staph. albus and, perhaps to a somewhat lesser extent, of some of the coliform organisms. The data in figures 14 and 15 excluded patients whose blood cultures yielded only Staph. albus; similar analyses of the numbers of the latter patients and of the deaths among them are shown in figure 16. Similar relationships were observed in patients whose blood cultures yielded only Staph. albus as were observed among those with blood cultures positive for significant organisms other than Staph. albus. The case fatality rates among the Staph. albus cases, however, were generally much lower for each age group and in each year of the study.

Comment

It has been possible in this paper to present only the bare facts; the possible interpretations and implications will not be discussed here. We have been dealing only with hospitalized patients among whom antibacterial agents were used intensively. We believe that these findings are, for the most part, real, as exemplified by the fact that all age groups were involved both in the drop in mortality in bacteremic patients after introduction of the antibacterial drugs and in the subsequent tendency for the mortality to rise.

Some of the numbers of cases may reflect, to some extent, the susceptibility of various organisms to modern chemotherapy and be somewhat distorted as a result. Thus, the number of patients with bacteremia, meningitis, or empyema after 1935 may be lower than the actual number of such patients observed among those with highly susceptible organisms, such as pneumococcus or hemolytic streptococcus. The difference would consist of patients who may have received effective therapy before the materials for the cultures were

obtained. The possible distortion in the number of patients with pneumococcic meningitis in 1957, as already noted, is an example in point. There were also several patients with empyema complicating pneumococcic pneumonia whose initial thoracentesis yielded purulent pleural fluid that gave no growth. In some of these fluids, pneumococci could still be identified in direct smears, but these patients were excluded from the present study because the cultures of the same and subsequent fluids yielded no growth. In as much as such cases generally had a favorable outcome, the results among the groups of cases with susceptible organisms were probably even better, as far as mortality is concerned, than those depicted in the figures.

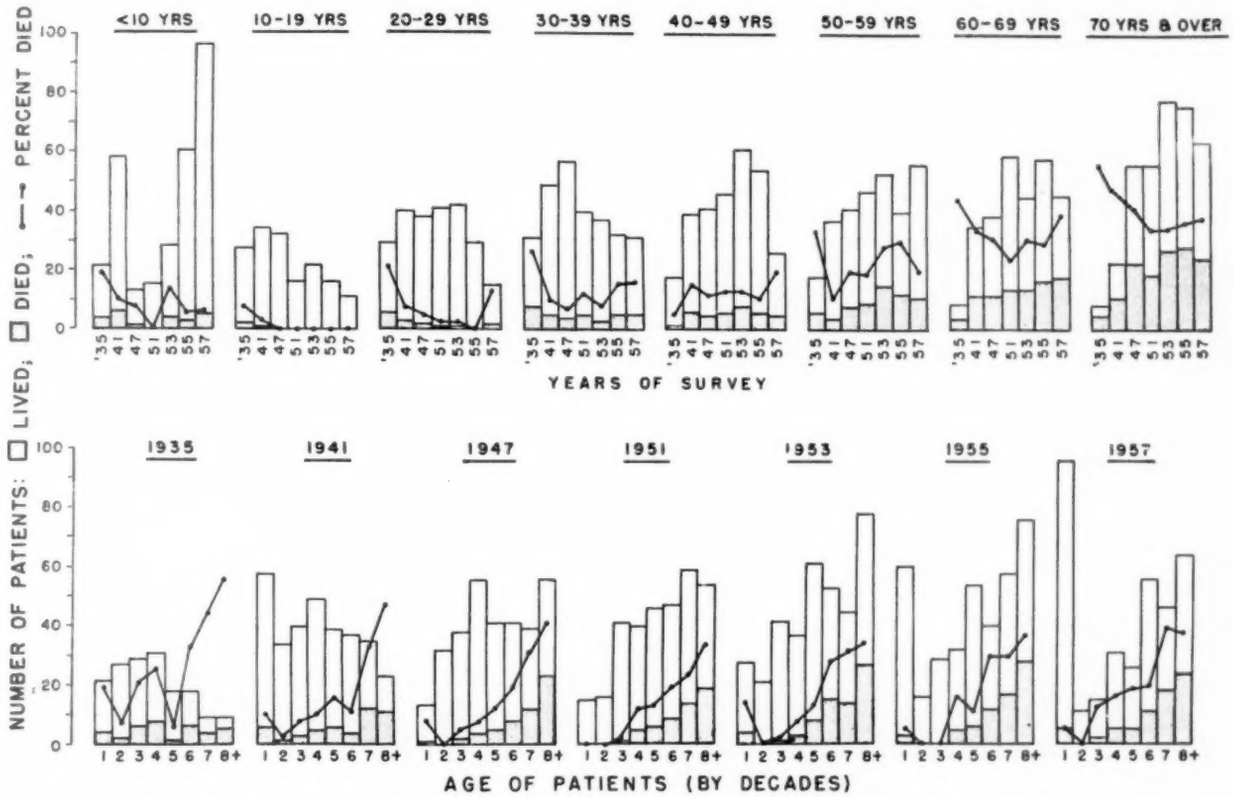


Fig. 16.—Occurrence and outcome of patients with blood cultures positive only for Staph. albus.

The favorable impact of the antibacterial drugs, at least as revealed in the data from this one hospital, has been accompanied by variable changes in the numbers of patients and has been reflected primarily in a marked reduction in the number of deaths from serious infections due to certain common bacterial pathogens, notably pneumococcus and hemolytic streptococcus. This, however, has been generally overshadowed by the greater increase in the number of cases and deaths from other serious infections and blood stream invasions with Staph. aureus and with certain other organisms, notably enterococci and the coliforms, including Aerobacter, Proteus, and Pseudomonas organisms. These had not previously been considered highly pathogenic and had only infrequently caused fatal infections before the era of antibacterial drugs. The net result has been a drop in the number of deaths from bacterial infections through 1947, followed by a significant and steady increase beyond that which antedated the era of antibacterial drugs.

In over-all effectiveness, as reflected in case fatality rates in serious infections, the most favorable effect of the antibacterial agents would seem to have been exerted during the sulfonamide era, with only a slight further improvement during the period when the use of penicillin and streptomycin was becoming very popular. This was followed by a steady increase in the total number of cases and deaths from bacterial infections and reduced effectiveness of the drugs against staphylococcus infections. These infections increased in incidence, along with the appearance and increase in numbers of cases of infections with enterococci and coliform organisms, against which the available drugs have only relatively slight activity.

Conclusions

These findings could be interpreted as pointing to the immediate need for broadening the scope of the current search for new antimicrobial agents to include not only the resistant staphylococci but also the relatively resistant coliform organisms. However, it would appear to be more pertinent to direct research toward evaluating in detail and attempting to overcome the profound changes produced by the antibiotics in the host and in his total bacterial flora, changes which seem to enhance the number, pathogenicity, and invasiveness of various micro-organisms which, under ordinary circumstances, appear to be rather benign. Even more, the findings presented here point to the urgent need for methods of broadly increasing resistance against bacterial infections in general, and particularly against those in which currently available antimicrobial agents do not appear to be highly effective.

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The authors wish to express their appreciation to the Misses Marion E. Lamb and A. Kathleen Daly of the Bacteriological Laboratory, Mallory Institute of Pathology, who carried out and made available bacteriological data.

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J.Am.Med.Assoc. 170:84/2188 (Aug. 29) 1959.

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ASSISTANT CHIEF PHARMACIST—102 bed general hospital located in Oregon. Pleasant surroundings in college city of 8,000-20,000 students. Male or female. must be registered. Forty hour week, two weeks' vacation, holidays and sick days. PO-166

ASSISTANT CHIEF PHARMACIST—350 bed general hospital. Assist in training and supervision of employees and in plans and projects of dept. Direct dept. in absence of chief pharmacist. Registration in Ohio and B.S. degree required. Only male considered, must be over 21 years of age. Forty hour week, two weeks vacation, Social Security, paid holidays, group hospitalization, sick leave. PO-165

STAFF PHARMACIST—100 bed general hospital located in Texas. Assume personal responsibility for accurate filling of prescriptions and supplies, assist in inspecting drugs in nursing stations, replace stock taken from night emergency container, inspect and refill ophthalmic solution trays from operating room, emergency room and central supply. Female preferred. Must be registered or eligible for registration in Texas. Forty hour week, 2 weeks' vacation after one year, paid holidays, 7 days sick leave. PO-164

CHIEF PHARMACIST—150 bed general hospital located in Ft. Lauderdale, Fla. Applicant must be a graduate of an accredited school of pharmacy, registered in Fla. and experienced as a hospital pharmacist. Forty hour week. PO-163

STAFF PHARMACIST—900 bed G.M.&S. with domiciliary hospital located in W. Va. Duties include compounding and dispensing prescriptions and medications at full professional level. Must be U. S. citizen and have completed at least a four-year course in pharmacy with a Bachelor's, Master's or Doctor's degree from an approved school. In addition, must have one year's experience as a registered pharmacist. Forty hour week, 13 days paid vacation per year to start, paid sick leave, retirement, injury compensation and life insurance. This is a Federal position subject to all appointment requirements established by the U. S. Civil Service Commission. PO-162

ASST. CHIEF PHARMACIST—280 bed general hospital. Duties include filling prescriptions and medicine orders from various units, supervise pharmacy clerks, assume administrative responsibility when chief pharmacist is absent. Forty-four hour week, sick leave and six paid holidays. Must be registered in Ill. PO-161

ASST. CHIEF PHARMACIST—293 bed general hospital. Dispensing drugs to nursing stations, filling special orders for patients, ordering stock, keeping records and some manufacturing. Forty hour week, 2 weeks' vacation, 12 days sick leave, 6 holidays, meals while on duty, free hospital care. Must be registered in Md. PO-160

ASST. CHIEF PHARMACIST—235 bed general hospital located 7 miles from Akron, Ohio. Hospital expanding to 310 beds in 1960, pharmacy expanding to serve 500 beds. Filling prescriptions, small volume of manufacturing. Must assume responsibility for pharmacy in the absence of chief pharmacist. Forty hour week, 2 weeks' vacation, hospitalization insurance paid for employee after 6 months probationary period, paid sick leave, 6 paid holidays. PO-159

CHIEF PHARMACIST—103 bed general hospital. Purchasing, receiving and issuing of pharmacy supplies. Taking inventory once a year. Filling out various reports necessary to operation of dept., etc. Must be registered in Wash. State. Forty hours per week, 2 weeks' vacation, 7 paid holidays, 1 sick day per month cumulative to 48, Blue Cross Insurance available. PO-158

STAFF PHARMACIST—269 bed nonprofit general hospital located in Calif. Duties include filling ward orders, individual prescriptions, outpatient prescriptions and narcotic orders. Applicant must have B.S. in pharmacy, 1 year's experience or preferably hospital pharmacy internship. Willingness to work week ends and nights as required. Male or female. Forty to forty-eight hour week, two weeks' vacation after one year, 6 paid holidays, 12 days sick leave, hospital health insurance plan. PO-157

CHIEF PHARMACIST—190 bed general hospital located in Wis. Pharmacist will have complete control of the pharmacy, responsible for dispensing, charges, inventory and purchasing. Work with Medical Staff to formulate policies for dept. with administrative approval. Capable of cooperating with the Medical Staff, helping the Medical Staff keep abreast of advances in the field, and guiding and directing the Nursing Staff in their usage of drugs. Thirty-six to forty-four hour week, two weeks' vacation after one year, Municipal Pension Plan, insurance, 10 days sick leave per year accumulative to 30. Must be registered in Wis. PO-156

SUPERVISOR OUTPATIENT PHARMACY OR STAFF PHARMACIST—236 open bed general state hospital located in Ark. Supervisor's duties include some teaching of pharmacy students, supervise one other pharmacy and administer this subdivision which fills about 200 prescriptions daily. Must be an especially intelligent and well trained pharmacist preferably with an internship in hospital pharmacy. STAFF PHARMACIST rotates among the various subdivisions of the hospital pharmacy: outpatient pharmacy, inpatient pharmacy, non sterile manufacturing and sterile manufacturing. Should be a good pharmacist, intelligent, interested in hospital pharmacy professionally. Forty hour week, vacation, 6 paid holidays per year, opportunity to learn in one of the most active hospital pharmacy depts. in the country, after 2 years participate in retirement program which provides essentially a 6% increase in salary, close relationships with schools of pharmacy, medicine and nursing. PO-154

ASST. CHIEF PHARMACIST—340 bed general hospital located in Syracuse. Assist chief pharmacist in dispensing drugs and pharmaceutical supplies, no manufacturing. Must be registered in N. Y. Forty-four hour week, 2 weeks' vacation, sick leave, holidays, retirement plan, good promotional possibility, stable job and excellent working conditions. PO-153

STAFF PHARMACIST—215 bed general hospital. Compound and dispense drugs, manufacture pharmaceuticals and assist in all other pharmaceutical duties in the pharmacy. B. S. required. Must be eligible for licensure in Pa. Forty hour week, three weeks' vacation, 7 holidays, 10 days paid sick leave, annual physical examinations, merit salary increases. PO-152

ASST. CHIEF PHARMACIST—220 bed general hospital located in Honolulu, Hawaii. Compounds and dispenses medicines and preparations. Responsible for administration of dept. in absence of chief pharmacist. Forty hour week, 3 weeks' vacation, paid sick leave, medical insurance, retirement. Must be eligible for licensure in Hawaii. PO-151

ASST. PHARMACIST—250 bed general hospital. Forty hour week, 2 weeks' vacation, sick leave and 6 paid holidays per year. Must be registered in N. C. PO-150

STAFF PHARMACIST—370 bed general private hospital. Moving to new 400 bed hospital in Jan. 1960. Compound and dispense medicines and preparations according to prescriptions ordered by medical staff either in central pharmacy or in pharmacy unit on a 100 bed floor. Related work such as keeping supply levels up, manufacturing solutions, etc. Outstanding opportunity for career in ethical pharmacy. Forty hour week, two weeks' vacation after one year, three weeks' after five years, 7 paid holidays, sick leave, employee credit union, merit increases. Must be eligible for licensure in Calif. PO-148

ASST. CHIEF PHARMACIST—440 bed teaching hospital. Must be registered in Mo. Forty-four hour week, three weeks' vacation, one week sick leave, state retirement and insurance. PO-147

ASST. CHIEF PHARMACIST—250 bed general hospital located in N. Y. Male preferred. Registration in N. Y. required. Ability to pass N. Y. State Civil Service examination. Duties include filling ward orders, patient prescriptions, checking stock and small volume parenteral solution manufacturing. Forty hour week, 3 weeks' vacation, annual sick leave, 7 paid holidays, retirement plan, group insurance available. Located outside city. Some housing available on premises. PO-146

STAFF PHARMACIST—650 bed general hospital located in Chicago, Ill. B. S. required. Must be eligible for registration in Ill. Male under 35 years preferred. Duties include general dispensing (inpatient and outpatient) and teaching. Forty hour week, one month vacation with pay, free medical benefits, retirement program. PO-145

CHIEF PHARMACIST—110 bed general hospital located in Ill. Must be eligible for licensure in Ill. Duties include administration of the dept., purchasing, maintaining inventory records, preparing scientific and educational exhibits, liaison between medical staff and administration, assisting in establishment and maintenance of a formulary and a formulary committee. Forty to forty-four hour week, two weeks' vacation. PO-144

CHIEF PHARMACIST—145 bed general hospital. Male preferred. Will have complete responsibility of pharmacy dept. Must have registration in Ohio. Forty-four hour week, vacation, sick leave and paid holidays. PO-143

ASST. CHIEF PHARMACIST—166 bed hospital located in Montana. Forty hour week, two weeks' vacation. PO-142

CHIEF PHARMACIST—155 bed hospital located in N. J. Must be registered in N. J. Dispense drugs to nursing units, maintain a formulary and confer with Medical Staff Formulary Committee, maintain up-to-date adequate inventory records, administer alcohol and narcotic storage and issuance, interview drug representatives and make purchases of drugs subject to administrator's approval, establish together with the administrator appropriate charges for drugs, and issue inpatient and outpatient drug charge slips. Generous benefits. PO-141

ASST. CHIEF PHARMACIST—Woman preferred. Must have Pa. registration. Duties include filling prescriptions and small volume of manufacturing. Forty hour week, 7 holidays per year, 7 sick days with pay per year. PO-139

CHIEF PHARMACIST—65 bed (increasing to 100 bed) general hospital located in N. Y. Carry out functions of pharmacy dept. Opportunity to be named Chief Purchasing Agent and be chief purchaser for the hospital. Forty hour week, up to 3 weeks vacation. Located in low cost living area. PO-138

CHIEF PHARMACIST—495 bed general hospital located in Va. Responsible to superintendent for management of pharmacy personnel, solution manufacturing, purchase of all pharmaceutical items and supervision of compounding and dispensing drugs. Lecture student nurses. Must be registered. Varied working hours, 3 weeks' vacation. Benefits include meals while on duty, hospitalization insurance, if single—room available. PO-137

STAFF PHARMACIST—250 bed general hospital located in Rochester, N. Y. Must be registered in N. Y. Forty hour week, liberal personnel policies. PO-136

CHIEF PHARMACIST—70 bed general hospital, located in N. C. Responsible for establishing a pharmacy dept. and assisting in the purchasing dept. Generous benefits. PO-135

CHIEF PHARMACIST—150 bed general hospital located in N. M. To assume complete charge of purchasing and distributing drugs. PO-134

STAFF PHARMACIST—75 bed general, private hospital located in Ind. State registration required. Male or female. PO-131

CHIEF PHARMACIST—120 bed general, nonprofit hospital. Individual will have complete charge of ordering, dispensing and charging of medical supplies. Male or female. Registration in Ohio required. Forty to forty-eight hour week, two weeks' vacation, other generous hospital benefits. PO-129

ASST. CHIEF PHARMACIST—325 bed hospital. Forty hour week, 4 weeks' vacation. Must be eligible for registration in Pa. PO-128

CHIEF PHARMACIST—185 bed private nonprofit hospital located in Va. Prefer applicant with hospital pharmacy internship and one year's experience. PO-126

STAFF PHARMACIST—450 bed general hospital located in Ohio. PO-124

ASST. CHIEF PHARMACIST—3,300 bed psychiatric hospital. To assist in the reorganization of the dept. Eligible for registration in Ohio. Two years' experience preferred. PO-123

CHIEF PHARMACIST—60 bed mission hospital operated by Presbyterian National Missions; extensive outpatient dept.; on Navajo Indian Reservation near Gallup, N. M. Qualified to register in Ariz.; single man or woman, challenged by service rather than benefits. PO-122

STAFF PHARMACIST—150 bed general hospital. Only female considered. Must be eligible for Ill. registration. Forty hour week, 2 weeks' vacation. PO-116

ASST. CHIEF PHARMACIST—425 bed general hospital. Duties include dispensing and supervision of special projects. Prefer male applicant with internship in hospital pharmacy. Unique opportunity to obtain experience. PO-115

STAFF PHARMACIST—320 bed teaching hospital in South, affiliated with medical school. Outpatient clinic and hospital pharmacy internship program. Forty hour week, 12 days sick leave, 2 weeks' vacation. PO-112

STAFF PHARMACIST—TWO—Eligible for licensure in West Va. and Ky. PO-111

STAFF PHARMACIST—215 bed general hospital expanding to 35 more beds. N. Y. registration required as well as hospital experience. Forty hour week, 2 weeks' vacation. PO-104

ASST. CHIEF PHARMACIST—152 bed general hospital expanding to 180 beds. Registration in Neb. required. Forty hour week, 2 weeks' vacation. PO-101

STAFF PHARMACIST—400 bed general hospital located in Iowa. Forty hour week, 2 weeks' vacation. PO-99

CHIEF PHARMACIST—425 bed hospital. Male preferred. Mo. registration required. Will train good applicant. Forty hour week. PO-98

STAFF PHARMACIST—400 bed general hospital. Eligible for registration in Fla. Forty hour week PO-96

STAFF PHARMACIST—500 bed general hospital located in Okla. B. S. required. Forty hour week. PO-95

ASST. CHIEF PHARMACIST—315 bed general hospital. Registration in Iowa required. Experience desirable. Forty hour week, 2 weeks' vacation. PO-92

ASST. CHIEF PHARMACIST—237 bed general hospital in West Va. Female desired. Forty-four hour week, 2 weeks' vacation. PO-77

STAFF PHARMACIST—335 bed hospital located in Fla. Duties include responsibilities in outpatient dept. and parenteral solution room. Forty hour week, 2 weeks' vacation. One meal daily. PO-75

STAFF PHARMACIST—325 bed research hospital. Minimum 2 years' experience, preferably in hospital pharmacy. N. Y. registration required. Duties include manufacturing sterile solutions and assisting in product development. Research work beyond forty hour week available at hourly rate. PO-61

CHIEF PHARMACIST—88 bed hospital located in Pa. Planning expansion to 125 beds for general patients and 40 beds for chronic patients. Possibility for pharmacist to serve as Asst. Adm. in charge of Purchasing, Central Supply, and Store Room. Forty hour week, 2-4 weeks' vacation. Young man preferred. PO-59

ASST. CHIEF PHARMACIST—Large voluntary hospital located in Brooklyn. Must be eligible for registration in N. Y. Supervisory ability needed. Thirty-five hour week, 2 weeks' vacation, 10 days' sick leave, 9 holidays. PO-51

STAFF PHARMACIST—460 bed general hospital in Mass. Forty hour week, 2 weeks' vacation, other benefits. PO-40

ASST. CHIEF PHARMACIST—310 bed general hospital located in Va. Forty hour week, 2 weeks' vacation, 3 weeks' sick leave, 6 holidays. Also STAFF PHARMACIST in same hospital. Forty hour week, 2 weeks' vacation. PO-35

STAFF PHARMACIST—550 bed general hospital located in Ohio. Forty hour week, 2 weeks' vacation. PO-34

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ASST. OR STAFF PHARMACIST—Female, single. Received B. S. from Texas Southern University in 1958. One year hospital pharmacy experience. Registered in Texas and Utah. Prefers West and East. PW-208

CHIEF PHARMACIST—Male, married. Received B. S. in 1957 from Brooklyn College of Pharmacy. Over one year hospital pharmacy experience. Registered in N.Y. and Ill. Prefers East. PW-207

ASST. CHIEF PHARMACIST—Male, single. B. S. received in 1956 from Columbia University College of Pharmacy. Served hospital pharmacy internship. Two years' hospital pharmacy experience. Registered in N. Y. Prefers New York City. PW-206

DIRECTOR OF PHARMACY SERVICE AND/OR CHIEF PHARMACIST—Male, married. Served hospital pharmacy internship and received M. S. in Hospital Pharmacy from the University of Mich. in June, 1959. Seven years' hospital pharmacy experience. Registered in Ill. and Mich. Will locate anywhere. PW-205

CHIEF PHARMACIST—Male, married. M. S. received from Philadelphia College of Pharmacy and Science in 1957. Served hospital pharmacy internship. Over four years' hospital pharmacy experience. Registered in Nebr., Ky., Iowa, and Pa. Prefers Midwest. PW-204

CHIEF PHARMACIST—Male, married. B. S. received from R. I. College of Pharmacy in 1953. Served hospital pharmacy internship from 1953-1955 at Jefferson Medical College Hospital. Four years' hospital pharmacy experience. Registered in Mass., R. I., Pa., and N. J. Prefers East. PW-203

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. B. S. received from St. Louis College of Pharmacy in 1946. Fifteen years' hospital pharmacy experience. Registered in Mo. and S. C. Prefers Southeast section of country. PW-202

CHIEF PHARMACIST—Male, married. Served internship. Over three years' hospital pharmacy experience. Registered in Ohio and Pa. Prefers South. PW-201

STAFF OR ASST. CHIEF PHARMACIST—Male, single. B. S. degree received from Duquesne University, Pittsburgh in 1959. Served two years internship in hospital pharmacy. Registered in Pa. Will locate anywhere in U. S. PW-200

STAFF PHARMACIST—Female, single. B. S. Seven years' hospital pharmacy experience. Southwest section of country preferred. Registered in Ala. and Ga. PW-199

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. received in 1952. One year's hospital pharmacy experience. Prefers Southeast section of country. Registered in Va. PW-198

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. received from Philadelphia College of Pharmacy and Science, 1956. Two and one-half years' hospital pharmacy experience and 6 years' experience in manufacturing, mainly parenterals. Presently working in Nicaragua. Will locate anywhere in U. S. PW-197

PHARMACIST—Male, single. Hospital pharmacy experience. B. S. Registered in Mo. and Ill. Will locate anywhere. PW-196

CHIEF PHARMACIST—Male, married. B. S. received in 1953. Four years' hospital pharmacy experience. Prefers Eastern part of country. Registered in Pa. and N. Y. PW-195.

STAFF PHARMACIST—Female, single. B. S. Hospital pharmacy experience. Prefers central southern part of Canada. Registered in Philippines. PW-194

CHIEF PHARMACIST—Male, married. B. S. Ten years' hospital pharmacy experience. Registered in Pa., N. Y., and Fla. Prefers to locate in Pa. or N. Y. PW-193

CHIEF PHARMACIST—Male, single. A. B. degree received in 1949. Six years' hospital pharmacy experience. Prefers teaching hospital. Registered in Mass. and Conn. Desires to locate in East. PW-192

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. received from City College of N. Y. Hospital pharmacy experience. Registered in N. Y. Prefers to locate in Northeast. PW-191

STAFF PHARMACIST—Male, married. B. S. One year's hospital pharmacy experience. Registered in N. Y. and Fla. Prefers to locate in Fla. PW-190

CHIEF PHARMACIST—Male, single, B. S. Registered in Minn. and N. D. Prefers foreign job anywhere. PW-189

CHIEF PHARMACIST—Male, married. B. S. Six years' hospital pharmacy experience. Prefers to locate in Calif. Registered in Calif. and Ill. PW-187

CHIEF PHARMACIST—Male, married. M. S. Hospital experience. Prefers to locate in East. Registered in N. Y., Mich., N. J., and Fla. PW-184

PHARMACIST—Male, single. B. S. received in 1956. One year's hospital pharmacy experience. Would prefer Chicago area. Registered in Mich. PW-186

PHARMACIST—Male, married. B. S. Three years' experience in Sudan Interior Mission Hospital. Prefers to locate in South particularly S. C. Registered in S. C. PW-183

STAFF OR ASST. CHIEF PHARMACIST—Female, single, B. S. Three years' hospital experience. Prefers to locate in Midwest. Registered in Mo. PW-181

PHARMACIST—Male, married. B. S. Interested in career in hospital pharmacy. Prefers to locate in East. Registered in N. Y. and Ill. PW-180

CHIEF PHARMACIST—Male, single. B. S. Four years' hospital experience. Interested in manufacturing and administration. Registered in Conn. Prefers Northeast section of country. PW-179

ASST. CHIEF OR CHIEF PHARMACIST—Male. B. S. received in 1954. Desires to locate in Mich., Ohio or Ill. Registered in Mich. PW-177

ASST. CHIEF OR STAFF PHARMACIST—Female, single. B. S. Registered in La. and Ohio. Prefers Ohio and Northern part of country. PW-176

CHIEF PHARMACIST—Male, married. B. S. Registered in Mo. and Kansas. Prefers Southeast or Southwest section of country. Desires position with possibility of assuming administrative duties. PW-174

PHARMACIST—Butler University graduate with Ph.C. degree. Registered in Ill., Ky., Ind., and Ore. Prefers to locate in Midwest. PW-173

PHARMACIST—Graduate Philadelphia College of Pharmacy and Science 1959; 22 months' hospital pharmacy experience. Registered in Pa. Desires position in the East. PW-172

STAFF PHARMACIST—Female. 1957 graduate of the University of Buffalo College of Pharmacy. Registered in N. Y. Prefers to locate in the East. PW-171

PHARMACIST—Female. Graduate of the University of Idaho, 1954. Registered in Ill. Hospital experience. Prefers Chicago area. PW-166

CHIEF OR ASST. CHIEF PHARMACIST—Female. B. S. and M. S. Purdue University. Ten years' hospital pharmacy experience. Registered in Ind. and Ky. PW-164

PHARMACIST—Male. Registered in La. and Mo. Experienced. Prefers Midwest. PW-161

STAFF PHARMACIST—Male, married. Registered in N. Y. and N. J. Prefers New England. PW-157

ASST. CHIEF PHARMACIST—Male, single. Registered in N. Y. and Vt. Served hospital pharmacy internship, now employed part-time staff pharmacist. Prefers Eastern part of country. Has M. S., 4 years hospital pharmacy experience. PW-154

CHIEF PHARMACIST—Male, married. B. S. Ten years' hospital pharmacy experience. Registered Mass., Ill., Mo., Ky., Tenn., and Va. PW-150

PHARMACIST—Male, single. B. S. pharmacy, June 1959. Locate East. PW-149

ASST. CHIEF OR CHIEF PHARMACIST—Single, male. Registered in D. C., Ill., Md., and Pa. Graduate University of Pittsburgh in 1953, experience in research. Prefers North and East. PW-148

CHIEF PHARMACIST—Registered in Mo. and Ill. Ph.G. degree. Eight years' experience in hospital pharmacy. PW-147

STAFF PHARMACIST—Male, single. Completed military requirements. Hospital pharmacy experience. Prefers East. PW-146

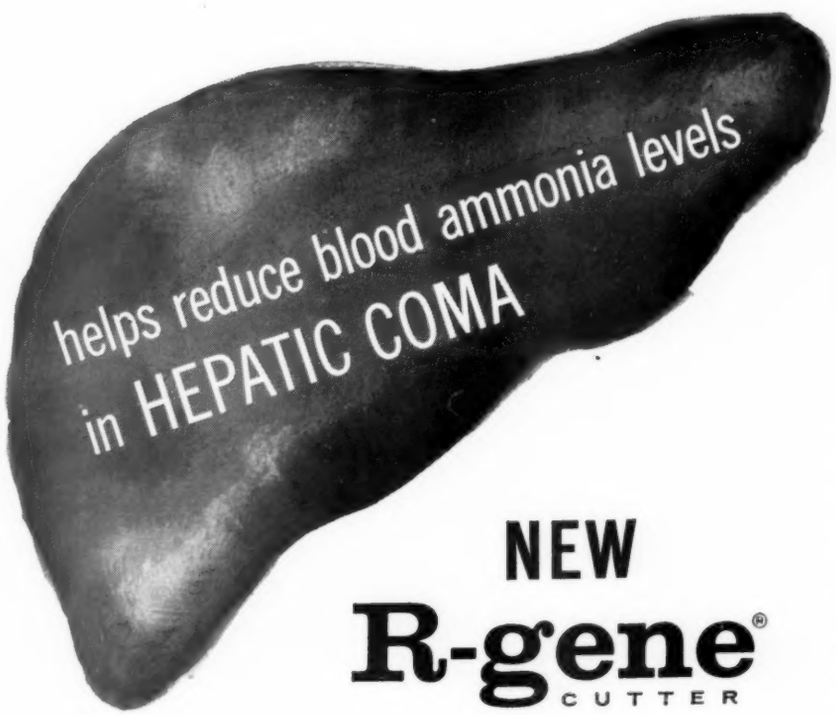
CHIEF PHARMACIST—Prefers N. Y. or N. J. area. Over 20 years' experience as chief pharmacist and purchasing agent. Graduate St. John's University College of Pharmacy. Registered in N. Y. and N. J. PW-144

CHIEF PHARMACIST—Male, married, B. S. Conn. registration. Five years' hospital pharmacy experience. Prefers Northeast section of country. PW-140

PHARMACIST—Male, single. Registered Conn. and N. J. Five years' hospital pharmacy experience. B. S. Prefers Conn. or Texas. PW-123

ASST. DIRECTOR OR DIRECTOR OF PHARMACY SERVICES—Male, single. B. S. Retail and five years' hospital experience. Registered Ill. PW-119.

CHIEF PHARMACIST—Female, single. Registered in Pa. and Ohio. Twelve years' experience as chief pharmacist. Desires to locate in Pa. or Ohio. PW-111



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*Najarian, J. S., and Harper, H. A.: Am. J. Med. 21:832, 1956.

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FORMERLY The BULLETIN

DON E. FRANC[illegible], Editor

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CIBA PHARMACEUTICAL PRODUCTS, INC.
Doriden, Ap-OBC; My-OBC; Je-OBC; S-OBC; O-OBC; N-OBC
Esidrix, Mr-8-9; Ap-2-3, 32, 211; My-11; Je-18; Jl-14; Ag-22; S-44; O-16; N-54; D-OBC

CIBA PHARMACEUTICAL PRODUCTS, INC. (cont.)
Esidrix-Serpasil, Je-9; Jl-4; Ag-5; S-42-43; O-22-23
Ritalin, Ja-OBC; F-OBC; Mr-OBC
Ritalin, Parenteral, Mr-25; Ap-27
Ritonic, Mr-3; O-32
Singoserp, Jl-OBC; Ag-OBC
Tessalon Perles, Ap-16; My-36; S-15; O-5; N-51

CLAY ADAMS
Ioclide, Ja-5; F-11

CUTTER LABORATORIES
R-Gene, Ja-26; F-28; N-49; D-745
Saftiflask "28", Jl-30; Ag-24; S-503; O-567

E

EATON LABORATORIES
Altafur, Ag-10-11; N-20-21
Furacin, Mr-15
Furadantin, My-14; N-32
Furoxone, Ja-8; Jl-16

ENDO LABORATORIES
Coumadin Sodium, My-31; Je-17; O-34; N-30-31
Numorphan, Jl-8; Ag-12; S-34; D-34
Percodan; Percodan-Demi, Mr-22; Ap-6

E. FOUGERA AND COMPANY, INC.
Orabilex, Ja-19; F-9; Mr-23; Ap-21; My-3; Je-21; Jl-23; Ag-19; S-6; O-9; N-29; D-9

G

GEIGY PHARMACEUTICALS
Dulcolax, My-21; Jl-25
Preludin Endurets; Preludin Tablets, Ap-7; Je-23
Tofranil, Jl-6-7; Ag-26-27; S-10-11; O-12-13; N-24-25; D-12-13

H

HYNSON, WESTCOTT AND DUNNING, INC.
Bromsulphalein, My-28; S-26; N-26
Lactinex, Ja-13

K

KNOLL PHARMACEUTICAL COMPANY
Akineton, D-8
Dilaudid, N-35; D-15

L

LAKESIDE LABORATORIES, INC.
Catron, Ag-20-21; S-35; N-13
Caytine, F-27
Imferon, Ja-29

LEDERLE LABORATORIES
Aristocort Cream, Aristocort, Aristocort Ointment, Aristomin, Neo-Aristocort, Aristogesic, Aristocort Parenteral, N-44-45
Declomycin, N-8-9
Diagnostic Agents, Ag-28
Kynex, Ap-42
Varidase, Je-8; O-28

LEHN AND FINK PRODUCTS CORPORATION
Amphyl, F-100; Ap-38; Je-322
Lysol; O-Syl; Tergisyl, Ap-38
Staph Newsletter, Ag-36; O-44; D-42

ELI LILLY AND COMPANY
Darvon Compound, Mr-IFC; O-IFC
Darvo-Tran, D-IFC
Ergotrate Maleate, My-IFC
Ilosone, Ja-IFC, N-IFC
Merthiolate, Ag-IFC
Seconal Sodium, Ap-IFC; S-IFC
Tes-Tape, Jl-IFC
Tuinal, Je-IFC
V-Cillin K, F-IFC

M

THE MACBICK COMPANY
Clik-O-Vac, My-8; S-16; O-38; D-33
Pour-O-Vac, Ja-25; F-8; Mr-33; N-10

THE S. E. MASSENGILL COMPANY
Adrenosem, Ja-27; F-15; Ap-37; Je-16; S-23; N-18

McKESSON AND ROBBINS
McKesson Hospital Service Departments, Ja-21; F-5; Mr-5; Ap-25; My-9; Je-31; Jl-21; Ag-7; S-13; O-15; N-11; D-11

MEAD JOHNSON
Amifilter, Ja-12
Amigen, My-20
Amigen 800, Je-13
Enfamil, O-24-25

MERCK AND COMPANY, INC.
Codeine, Mr-150
Merck Index, N-53

MERCK SHARP AND DOHME
Hydro-Diuril, Ap-18-19

► ADVERTISING PAGES, ASHP AFFILIATES AND NEW MEMBERS in the AMERICAN JOURNAL OF HOSPITAL PHARMACY for 1959 have not been numbered consecutively. The following key to abbreviations will therefore identify these pages referred to in each particular issue.

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F	February	Ag	August
Mr	March	S	September
Ap	April	O	October
My	May	N	November
Je	June	D	December

WM. S. MERRELL COMPANY
Cepacol, Ap-20; My-16; Je-24; Jl-2; Ag-9; S-14; O-14; N-17; D-7
TACE, Ja-47; F-4; Mr-4

O

ORGANON, INC.
Cortrophin-Zinc, F-12-13; My-22-23
Durabolin, N-46-47
Liquaemin Sodium, Mr-11; Je-25

ORTHO PHARMACEUTICAL COMPANY
Actase, Je-10-12; Jl-5; S-18-19; O-20-21; N-22-23; D-26-27

P

PANRAY CORPORATION
Isoniazid; Parasal Preparations; Prednisone; Pyridoxine, Ja-16; Mr-12; Ap-24; Je-22; S-17; N-38

PARKE, DAVIS AND COMPANY
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Carbrital, Ja-2; Mr-102; Jl-324; Ag-378; O-506; N-574; D-692
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Chloromycetin Succinate, Ap-152; My-214
Quadrigen, S-430

PFIZER LABORATORIES
Terramycin Intramuscular, O-8; N-28; D-16

R

A. H. ROBINS COMPANY, INC.
Dimetane, My-33; Ag-13
Donnagel, Je-4; D-17
Donnatal, Ap-22; N-3
Phenaphen with Codeine, F-21; Jl-28
Robaxin, Mr-10; S-22
Robitussin; Robitussin A-C, Ja-18; O-26

ROCHE LABORATORIES, DIVISION OF HOFFMANN-LA ROCHE, INC.
Konakion, F-34; Mr-34; S-31; N-12
Synkayvite, Ja-30

J. B. ROERIG AND COMPANY
Tao, F-10; Ap-26; Je-33; Ag-8; N-36-37

S

SCHERING CORPORATION
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Fulvicin, D-18
Trilafon, Ja-11; F-17-19; Mr-27; Ap-11-13; My-17-19; Je-5-7; Jl-17-19; Ag-23; S-7-9; O-31; N-41-43; D-23-25

SMITH-DORSEY
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SMITH, KLINE AND FRENCH LABORATORIES
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Spansule, Je-34; Jl-3; Ag-3; S-21; O-39; D-19

E. R. SQUIBB AND SONS, DIV. OF MATHIESON CHEM. CORP.
Ether, Ja-IBC; Mr-IBC
Rautrax, N-IBC; D-IBC
Vesprin, F-IBC; Ap-IBC; My-IBC; Je-IBC; Jl-IBC; Ag-IBC; S-IBC; O-IBC;

T

TRAVENOL LABORATORIES, INC., PHARMACEUTICAL PRODUCTS, DIVISION OF BAXTER LABORATORIES, INC.
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U

THE UPJOHN COMPANY
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Gelfoam, My-25; Je-15; Jl-9
Lipomul I.V., F-33, 99; Mr-7; Ap-23
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W

WARREN-TEED PRODUCTS COMPANY
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Modane, D-38

WEST CHEMICAL PRODUCTS, INC.
Wescodyne, Ja-22-23; Mr-24; My-10; S-24

WINTHROP LABORATORIES
Alevaire, Mr-16; My-12; Je-19; N-34
A.P.C. with Demerol, Ja-49; S-32
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WYETH LABORATORIES
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► KEY TO ABBREVIATIONS FOR MONTHS:

Ja	January
F	February
Mr	March
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O	October
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